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6.3 Navier-Stokes methods; 6.4 Interpretation of numerical analysis; 6.5 Free-stream rudders; 6.6 Rudder-propeller interaction; 6.7 Unsteady behaviour; 6.8 Future developments; Part Three: Design Strategy and Methodology; Chapter 7. Detailed rudder design; 7.1 Background and philosophy of design approach; 7.2 Rudder design process; 7.3 Applications of numerical methods 7.4 Guidelines for design Chapter 8. Manoeuvring; 8.1 Rudder forces; 8.2 Hull upstream; 8.3 Influence of drift angle; 8.4 Low and zero speed and four quadrants; 8.5 Shallow water/bank effects; Chapter 9. Other control surfaces; 9.1 Fin stabilisers; 9.2 Hydroplanes; 9.3 Pitch damping fins; Chapter 10. Propulsion; 10.1 Propeller-rudder interaction; 10.2 Propeller effects; 10.3 Rudder effects; 10.4 Overall effects; Part Four: Design Applications; Chapter 11. Applications; 11.1 Background; 11.2 Large ships; 11.3 Small craft; 11.4 Low speed and manoeuvring; 11.5 Control; Appendix 1; Tabulated test dataAppendix 2; Rudder and propeller design software; Index; Color Plate Section

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## Sommario/riassunto

This book guides naval architects from the first principles of the physics of control surface operation, to the use of experimental and empirical data and applied computational fluid dynamic modelling of rudders and control surfaces. The empirical and theoretical methods applied to control surface design are described in depth and their use explained through application to particular cases. The design procedures are complemented with a number of worked practical examples of rudder and control surface design. The online companion site contains an extensive modelling data library,

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