

Contents

Preface.....ix

Acknowledgmentsxiii

Editor.....xv

Contributors..... xvii

Section I Introduction to Section 1: Nuclear Power Reactors

1. Historical Development of Nuclear Power.....3

Kenneth D. Kok

2. Pressurized Water Reactors (PWRs)9

Richard Schreiber

3. Boiler Water Reactors (BWRs).....83

Kevin Theriault

4. Heavy Water Reactors 141

Alistair I. Miller, John Luxat, Edward G. Price, Romney B. Duffey, and Paul J. Fehrenbach

5. High-Temperature Gas Cooled Reactors 197

Arkal Shenoy and Chris Ellis

6. Generation IV Technologies.....227

Edwin A. Harvego and Richard R. Schultz

Section II Introduction to Section 2: Nuclear Fuel Cycle

7. Nuclear Fuel Resources245

Stephen W. Kidd

8. Uranium Enrichment265

Nathan H. (Nate) Hurt and William J. Wilcox, Jr.

9. Nuclear Fuel Fabrication279

Kenneth D. Kok

10. Spent Fuel Storage293

Kristopher W. Cummings

11. Nuclear Fuel Reprocessing 315

Patricia Paviet-Hartmann, Bob Benedict, and Michael J. Lineberry

12. Waste Disposal: Transuranic Waste, High-Level Waste and Spent Nuclear Fuel, and Low-Level Radioactive Waste	367
<i>Murthy Devarakonda and Robert D. Baird</i>	
13. Radioactive Materials Transportation	403
<i>Kurt Colborn</i>	
14. Decontamination and Decommissioning: "The Act of D&D"— "The Art of Balance"	431
<i>Cidney Voth</i>	
15. HWR Fuel Cycles	475
<i>Paul J. Fehrenbach and Alistair I. Miller</i>	

Section III Introduction to Section 3: Related Engineering and Analytical Processes

16. Risk Assessment and Safety Analysis for Commercial Nuclear Reactors	525
<i>Yehia F. Khalil</i>	
17. Nuclear Safety of Government Owned, Contractor Operated Nuclear (GOCO) Facilities	543
<i>Arlen R. Schade</i>	
18. Neutronics	575
<i>Ronald E. Pevey</i>	
19. Radiation Protection	609
<i>Matthew Arno</i>	
20. Heat Transfer and Thermal Hydraulic Analysis	641
<i>Shripad T. Revankar</i>	
21. Thermodynamics/Power Cycles	713
<i>Yasuo Koizumi</i>	
22. Economics of Nuclear Power	727
<i>Jay F. Kunze</i>	
Index	751