

Contents

<i>Preface</i>	<i>page xi</i>
1 Ethics and Engineering: An Ethics-Up-Front Approach	1
1.1 The Dieselgate Scandal: Who Was Responsible?	1
1.2 Three Biases about Engineering and Engineering Ethics	4
1.3 Ethics and the Engineer	7
1.4 Ethics and the Practice of Engineering: Ethics Up Front	15
Part I Assessment and Evaluation in Engineering	
2 Risk Analysis and the Ethics of Technological Risk	23
2.1 The Unfolding of the Fukushima Daiichi Nuclear Accident	23
2.2 Assessing Technological Risk	27
2.3 How Did the Fukushima Disaster Fall through the “Cracks” of Risk Assessment?	30
2.4 What Risk Assessments Cannot Anticipate: “Normal Accidents”	33
2.5 The Ethics of Risk: Social Acceptance versus Ethical Acceptability	36
2.6 How to Deal with Uncertainties in Technological Risks	42
2.7 Summary	51
3 Balancing Costs, Risks, Benefits, and Environmental Impacts	53
3.1 The Grand Ouest Airport of Nantes: The End of Fifty Years of Controversy	53
3.2 What Is SCBA?	59
3.3 The Philosophical Roots of CBA: Utilitarianism	60
3.4 SCBA: Why, When, and How?	64
3.5 How to Deal with the Problems of CBA	72
3.6 Summary	78

Part II Ethics and Engineering Design

4	Values in Design and Responsible Innovation	81
4.1	The “Naked Scanner” as the Holy Grail of Airport Security	81
4.2	Why Does Ethics Matter in Engineering Design?	86
4.3	Designed for the Sake of Ethics: Persuasive Technology	87
4.4	How Do Values Matter in Engineering Design?	90
4.5	How to Systematically Design for Values	92
4.6	How to Deal with Conflicting Values	96
4.7	Responsible Research and Innovation	103
4.8	Summary	109
5	Morality and the Machine	111
5.1	The Uber Autonomous Car Accident in Arizona	111
5.2	Crash Optimization and Programming Morality in the Machine	119
5.3	The Ethics of AI	125
5.4	“Trustworthy” and “Responsible” AI: Toward Meaningful Human Control	132
5.5	Summary	136

Part III Engineering Ethics, Sustainability, and Globalization

6	Sustainability and Energy Ethics	141
6.1	Biofuel and a “Silent Tsunami” in Guatemala	141
6.2	There Is No Such Thing as “Sustainable Energy”!	147
6.3	Sustainability as an Ethical Framework	149
6.4	Sustainable Nuclear Energy: A Contradiction in Terms?	153
6.5	Energy Ethics	162
6.6	Summary	167
7	Engineering Ethics in the International Context: Globalize or Diversify?	169
7.1	Earthquakes and Affordable Housing in Iran	169
7.2	Moving beyond the Dilemmas of Western Engineers in Non-Western Countries	174
7.3	Is Engineering Ethics a Western Phenomenon?	176
7.4	The Need to Consider Engineering Ethics in the International Context	178

	Contents	ix
7.5 Globalizing or Diversifying Engineering Ethics?	181	
7.6 Summary	187	
<i>Bibliography</i>	189	
<i>Index</i>	218	