

Contents

Preface	iii
Foreword	vii
1. General Introduction	1
1.1 Operational Radiation Protection Quantities	1
1.2 Introduction of New Dose-Equivalent Quantities	1
2. Consideration of Quantities for the Practical Determination of Dose Equivalent	3
2.1 Desirable Properties of Quantities Used in Radiological Protection	3
2.2 Expansion and Alignment	4
2.3 Selection of Operational Quantities	4
3. Physical Data	6
4. Instrument Characteristics and Calibration	7
4.1 The Performance of Existing Instruments	7
4.2 Type Testing and Calibration of Instruments for New Quantities	9
5. The Relationships Between Quantities	12
5.1 The Relationship Between Individual and Environmental (Area) Monitoring Quantities and the Relevance of the Angular Distribution Factor	12
5.2 The Relationship Between Individual Monitoring Quantities and ICRP Limiting Quantities	12
6. Concluding Remarks	18
Appendix A: Concepts and Definitions as Used in this Report ...	19
Appendix B: Physical Data	22
B.1 Photons	22
B.1.1 Experimental and Calculational Approaches	22
B.1.2 Methods and Results of Radiation Transport Calculations in the Heterogeneous MIRD-5 Phantom	22
B.1.3 Methods and Results of Radiation Transport Calculations in the ICRU Sphere	26
B.1.3.1 Unrestricted, Deep and Shallow Dose- Equivalent Indices	28
B.1.3.2 Depth Dose Equivalent on the Aligned Radius .	29
B.1.3.3 Average Dose Equivalent	29
B.2 Neutrons	31
B.2.1 Experimental and Calculational Approaches	31
B.2.2 Methods and Results of Radiation Transport Calculations in the Heterogeneous MIRD-5 Phantom	31
B.2.3 Methods and Results of Radiation Transport Calculations in the ICRU Sphere	34
B.2.3.1 Dose-Equivalent Indices	35
B.2.3.2 Depth Dose Equivalent on the Aligned Radius .	38
B.2.3.3 Average Dose Equivalent	38

B.3	Beta Rays and Other Electrons	38
B.3.1	Experimental and Computational Approaches	38
B.3.2	Methods and Results of Radiation Transport Calculations in the Heterogeneous MIRD-5 Phantom	38
B.3.3	Methods and Results of Transport Calculations for the ICRU Sphere	38
B.3.4	Comparison of ICRU Sphere Data and MIRD-5 Phantom Data	39
	Appendix C: Rationale for the Choice of Monitoring Quantities	41
	References	44
	ICRU Reports	48
	Index	51

