

TABLE OF CONTENTS

VOLUME I

	Page
Part 1. GENERAL PROVISIONS, DEFINITIONS, TRAINING AND SECURITY	19
Chapter 1.1 - General provisions	21
1.1.1 Scope and application	21
1.1.2 Dangerous goods forbidden from transport	23
Chapter 1.2 - Definitions and units of measurement	25
1.2.1 Definitions	25
1.2.2 Units of measurement.....	35
Chapter 1.3 - Training	39
Chapter 1.4 Security provisions	41
1.4.1 General provisions	41
1.4.2 Security training	41
1.4.3 Provisions for high consequence dangerous goods	42
Chapter 1.5 General provisions concerning Class 7.....	45
1.5.1 Scope and application	45
1.5.2 Radiation protection programme	46
1.5.3 Quality assurance	47
1.5.4 Special arrangement	47
1.5.5 Radioactive material possessing other dangerous properties	48
1.5.6 Non-compliance	48
Part 2. CLASSIFICATION	49
Chapter 2.0 - Introduction	51
2.0.0 Responsibilities	51
2.0.1 Classes, divisions, packing groups	51
2.0.2 UN numbers and proper shipping names.....	53
2.0.3 Precedence of hazard characteristics	55
2.0.4 Transport of samples	57
Chapter 2.1 - Class 1 - Explosives.....	59
2.1.1 Definitions and general provisions	59
2.1.2 Compatibility groups	61
2.1.3 Classification procedure	63
Chapter 2.2 - Class 2 - Gases	75
2.2.1 Definitions and general provisions	75
2.2.2 Divisions	75
2.2.3 Mixtures of gases	77

TABLE OF CONTENTS (cont'd)**VOLUME I**

	Page
Chapter 2.3 - Class 3 - Flammable liquids	79
2.3.1 Definition and general provisions.....	79
2.3.2 Assignment of packing groups	80
2.3.3 Determination of flash point.....	81
2.3.4 Determination of initial boiling point	82
Chapter 2.4 - Class 4 - Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases	83
2.4.1 Definitions and general provisions	83
2.4.2 Division 4.1 - Flammable solids, self-reactive substances and solid desensitized explosives	84
2.4.3 Division 4.2 - Substances liable to spontaneous combustion	95
2.4.4 Division 4.3 - Substances which in contact with water emit flammable gases	96
2.4.5 Classification of organometallic substances	97
Chapter 2.5 - Class 5 - Oxidizing substances and organic peroxides	99
2.5.1 Definitions and general provisions	99
2.5.2 Division 5.1 - Oxidizing substances	99
2.5.3 Division 5.2 - Organic peroxides.....	102
Chapter 2.6 - Class 6 - Toxic and infectious substances	121
2.6.1 Definitions	121
2.6.2 Division 6.1 - Toxic substances.....	121
2.6.3 Division 6.2 - Infectious substances	127
Chapter 2.7 - Class 7 - Radioactive material	133
2.7.1 Definitions	133
2.7.2 Classification	134
Chapter 2.8 - Class 8 - Corrosive substances	161
2.8.1 Definition	161
2.8.2 Assignment of packing groups	161
Chapter 2.9 - Class 9 - Miscellaneous dangerous substances and articles, including environmentally hazardous substances.....	163
2.9.1 Definitions	163
2.9.2 Assignment to Class 9	163
2.9.3 Environmentally hazardous substances (aquatic environment).....	165
2.9.4 Lithium batteries.....	176

TABLE OF CONTENTS (cont'd)

VOLUME I	Page
Part 3. DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND EXCEPTIONS	179
Chapter 3.1 - General	181
3.1.1 Scope and general provisions	181
3.1.2 Proper shipping name	181
3.1.3 Mixtures or solutions	183
Chapter 3.2 - Dangerous goods list	185
3.2.1 Structure of the dangerous goods list	185
3.2.2 Abbreviations and symbols	186
Chapter 3.3 - Special provisions applicable to certain articles or substances.....	299
Chapter 3.4 - Dangerous goods packed in limited quantities	329
Chapter 3.5 - Dangerous goods packed in excepted quantities	333
3.5.1 Excepted quantities.....	333
3.5.2 Packagings	334
3.5.3 Tests for packages	334
3.5.4 Marking of packages	335
3.5.5 Maximum number of packages in any freight vehicle, railway freight wagon or multimodal freight container.....	336
3.5.6 Documentation	336
APPENDICES	337
Appendix A - List of generic and N.O.S. proper shipping names.....	339
Appendix B - Glossary of terms	359
ALPHABETICAL INDEX OF SUBSTANCES AND ARTICLES.....	371

TABLE OF CONTENTS**VOLUME II**

	Page
ANNEX: MODEL REGULATIONS ON THE TRANSPORT OF DANGEROUS GOODS..... (cont'd)	1
Part 4. PACKING AND TANK PROVISIONS	3
Chapter 4.1 - Use of packagings, including intermediate bulk containers (IBCs) and large packagings	5
4.1.1 General provisions for the packing of dangerous goods in packagings, including IBCs and large packagings	5
4.1.2 Additional general provisions for the use of IBCs	10
4.1.3 General provisions concerning packing instructions	10
4.1.4 List of packing instructions	14
4.1.5 Special packing provisions for goods of Class 1	98
4.1.6 Special packing provisions for goods of Class 2	100
4.1.7 Special packing provisions for organic peroxides (Division 5.2) and self-reactive substances of Division 4.1	102
4.1.8 Special packing provisions for infectious substances of Category A (Division 6.2, UN 2814 and UN 2900)	104
4.1.9 Special packing provisions for Class 7.....	104
Chapter 4.2 - Use of portable tanks and multiple-element gas containers (MEGCs).....	109
4.2.1 General provisions for the use of portable tanks for the transport of substances of Class 1 and Classes 3 to 9	109
4.2.2 General provisions for the use of portable tanks for the transport of non-refrigerated liquefied gases	114
4.2.3 General provisions for the use of portable tanks for the transport of refrigerated liquefied gases	115
4.2.4 General provisions for the use of multiple-element gas containers (MEGCs)	116
4.2.5 Portable tank instructions and special provisions	117
4.2.6 Transitional measures	133
Chapter 4.3 - Use of bulk containers	135
4.3.1 General provisions	135
4.3.2 Additional provisions applicable to bulk goods of Divisions 4.2, 4.3, 5.1, 6.2 and Classes 7 and 8	137
Part 5. CONSIGNMENT PROCEDURES	139
Chapter 5.1 - General provisions	141
5.1.1 Application and general provisions	141
5.1.2 Use of overpacks	141
5.1.3 Empty packagings	141
5.1.4 Mixed packing	141
5.1.5 General provisions for class 7	142

TABLE OF CONTENTS (cont'd)**VOLUME II**

	Page
Chapter 5.2 - Marking and labelling	147
5.2.1 Marking	147
5.2.2 Labelling	151
Chapter 5.3 - Placarding and marking of cargo transport units	159
5.3.1 Placarding	159
5.3.2 Marking	161
Chapter 5.4 - Documentation	163
5.4.1 Dangerous goods transport information	163
5.4.2 Container/vehicle packing certificate	169
5.4.3 Emergency response information	170
5.4.4 Retention of dangerous goods transport information	170
Chapter 5.5 - Special provisions	173
5.5.1 (Deleted)	173
5.5.2 Special provisions applicable to fumigated cargo transport units (UN 3359)	173
5.5.3 Special provisions applicable to packages and cargo transport units containing substances presenting a risk of asphyxiation when used for cooling or conditioning purposes (such as dry ice (UN 1845) or nitrogen, refrigerated liquid (UN 1977) or argon, refrigerated liquid (UN 1951))	175
Part 6. REQUIREMENTS FOR THE CONSTRUCTION AND TESTING OF PACKAGINGS, INTERMEDIATE BULK CONTAINERS (IBCs), LARGE PACKAGINGS, PORTABLE TANKS, MULTIPLE-ELEMENT GAS CONTAINERS (MEGCs) AND BULK CONTAINERS	179
Chapter 6.1 - Requirements for the construction and testing of packagings (other than for Division 6.2 substances)	181
6.1.1 General	181
6.1.2 Code for designating types of packagings	182
6.1.3 Marking	184
6.1.4 Requirements for packagings	187
6.1.5 Test requirements for packagings	198
Chapter 6.2 - Requirements for the construction and testing of pressure receptacles, aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas.	205
6.2.1 General requirements	205
6.2.2 Requirements for UN pressure receptacles.....	210
6.2.3 Requirements for non-UN pressure receptacles	229
6.2.4 Requirements for aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas	230

TABLE OF CONTENTS (cont'd)**VOLUME II**

	Page
Chapter 6.3 - Requirements for the construction and testing of packagings for Division 6.2 infectious substances of Category A.....	233
6.3.1 General	233
6.3.2 Requirements for packagings	233
6.3.3 Code for designating types of packagings	233
6.3.4 Marking	233
6.3.5 Test requirements for packagings.....	234
Chapter 6.4 - Requirements for the construction, testing and approval of packages and material for Class 7	239
6.4.1 (Reserved)	239
6.4.2 General requirements	239
6.4.3 Additional requirements for packages transported by air.....	240
6.4.4 Requirements for excepted packages	240
6.4.5 Requirements for industrial packages.....	240
6.4.6 Requirements for packages containing uranium hexafluoride	242
6.4.7 Requirements for Type A packages.....	242
6.4.8 Requirements for Type B(U) packages	244
6.4.9 Requirements for Type B(M) packages.....	246
6.4.10 Requirements for Type C packages.....	246
6.4.11 Requirements for packages containing fissile material	246
6.4.12 Test procedures and demonstration of compliance	251
6.4.13 Testing the integrity of the containment system and shielding and evaluating criticality safety	252
6.4.14 Target for drop tests	252
6.4.15 Test for demonstrating ability to withstand normal conditions of transport	252
6.4.16 Additional tests for Type A packages designed for liquids and gases	253
6.4.17 Tests for demonstrating ability to withstand accident conditions in transport	253
6.4.18 Enhanced water immersion test for Type B(U) and Type B(M) packages containing more than 10^5 A ₂ and Type C packages	255
6.4.19 Water leakage test for packages containing fissile material	255
6.4.20 Tests for Type C packages	255
6.4.21 Tests for packagings designed to contain uranium hexafluoride.....	256
6.4.22 Approvals of package designs and materials.....	256
6.4.23 Applications and approvals for radioactive material transport	256
6.4.24 Transitional measures for Class 7.....	267
Chapter 6.5 - Requirements for the construction and testing of intermediate bulk containers	269
6.5.1 General requirements	269
6.5.2 Marking	272
6.5.3 Construction requirements	275
6.5.4 Testing, certification and inspection.....	276
6.5.5 Specific requirements for IBCs	277
6.5.6 Test requirements for IBCs	284

TABLE OF CONTENTS (cont'd)**VOLUME II**

	Page
Chapter 6.6 - Requirements for the construction and testing of large packagings	295
6.6.1 General	295
6.6.2 Code for designating types of large packagings.....	295
6.6.3 Marking	296
6.6.4 Specific requirements for large packagings.....	297
6.6.5 Test requirements for large packagings.....	300
Chapter 6.7 - Requirements for the design, construction, inspection and testing of portable tanks and multiple-element gas containers (MEGCs)	305
6.7.1 Application and general requirements	305
6.7.2 Requirements for the design, construction, inspection and testing of portable tanks intended for the transport of substances of Class 1 and Classes 3 to 9	305
6.7.3 Requirements for the design, construction, inspection and testing of portable tanks intended for the transport of non-refrigerated liquefied gases	324
6.7.4 Requirements for the design, construction, inspection and testing of portable tanks intended for the transport of refrigerated liquefied gases	338
6.7.5 Requirements for the design, construction, inspection and testing of multiple-element gas containers (MEGCs) intended for the transport of non-refrigerated gases	351
Chapter 6.8 Requirements for the design, construction, inspection and testing of bulk containers	359
6.8.1 Definitions	359
6.8.2 Application and general requirements	359
6.8.3 Requirements for the design, construction, inspection and testing of freight containers used as bulk containers.....	359
6.8.4 Requirements for the design, construction and approval of bulk containers other than freight containers	360
6.8.5 Requirements for the design, construction, inspection and testing of flexible bulk containers BK3	361
Part 7. PROVISIONS CONCERNING TRANSPORT OPERATIONS.....	367
Chapter 7.1 - Provisions concerning transport operations by all modes of transport	369
7.1.1 Application, general provisions and loading requirements	369
7.1.2 Segregation of dangerous goods.....	370
7.1.3 Special provisions applicable to the transport of explosives	371
7.1.4 Special provisions applicable to the transport of gases	373
7.1.5 Special provisions applicable to the transport of self-reactive substances of Division 4.1 and organic peroxides of Division 5.2.....	373
7.1.6 Special provisions applicable to the transport of substances stabilized by temperature control (other than self-reactive substances and organic peroxides)	375
7.1.7 Special provisions applicable to the transport of Division 6.1 (toxic) and Division 6.2 (infectious) substances	376

TABLE OF CONTENTS (cont'd)**VOLUME II**

	Page
7.1.8 Special provisions applicable to the transport of radioactive material	377
7.1.9 Reporting of accidents or incidents involving dangerous goods in transport	381
7.1.10 Retention of dangerous goods transport information	381
 Chapter 7.2 - Modal provisions	383
7.2.1 Application and general provisions	383
7.2.2 Special provisions applicable to the transport of portable tanks on vehicles	383
7.2.3 Special provisions applicable to the transport of radioactive material	383
7.2.4 Security provisions for transport by road, rail and inland waterway	384
 TABLE OF CORRESPONDENCE between paragraph numbers in the IAEA Regulations for the Safe Transport of Radioactive material, (2012 Edition) and the eighteenth revised edition of the Recommendations on the Transport of Dangerous Goods (including the Model Regulations)	385