# USER-FRIENDLY STRUCTURE OF INTERNATIONAL REGULA-TIONS FOR THE TRANSPORT OF RADIOACTIVE MATERIAL

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### SUMMARY

To date the various modes of transport have used different structures in their codes for the transport of dangerous goods. Since the 1960's, the basis in the modal codes for the transport of class 7 - Radioactive material - has been the "Regulations for the Safe Transport of Radioactive Material" of the International Atomic Energy Agency, Vienna. The basis in the modal codes for all other classes of dangerous goods has been the "Recommendations on the Transport of Dangerous Goods" (Orange Book) of the United Nations, New York and Geneva.

Most of the national and international shipments are multi-mode transports and as a result one of the main problems for the shipper is to follow the various modal codes each with a different structure and partly inconsistent requirements. Consequently the restructuring of the regulations and codes appeared on the agenda of many past meetings in the United Nations framework and ADR and RID meetings.

This paper shows the draft of the restructured ADR and explains the changes. The aim of the restructuring is to make the document more user friendly by grouping similar requirements under single headings, thus making the code subject orientated as opposed to class orientated. This includes the provision of the class 7 material. The ultimate goal is the harmonization of all the modal codes and regulations. It is therefore the current thinking that the UN-Orange Book should become the model.

### HISTORICAL DEVELOPMENT AND STATUS

In the dangerous goods transport field there are two main international organizations preparing recommendations:

- the United Nations Economic and Social Council Committee of Experts on the Transport of Dangerous Goods (ECOSOC), Geneva, and
- the International Atomic Energy Agency (IAEA), Vienna.

The UN document covers all dangerous goods, whereas the IAEA only publish recommendations for radioactive materials (class 7). There are also various modal national and international organizations publishing regulations/agreements, obligatory for the Member States.

In the past the national and international organizations used the IAEA-Regulations for the "Safe Transport of Radioactive Material" [IAEA, 1990] as the basis for their own regulations. In addition, however, it was also necessary to take some recommendations for the radioactive material transport from the UN-Recommendation on the Transport of Dangerous Goods (the so-called "Orange Book"), e.g., the UN-numbers for the materials and the provisions for the subsidiary risks. But mostly the "Orange Book" [Orange Book, 1995] referred to concerns the transport of radioactive material to the IAEA-Regulations. There were also some differences between the two Regulations, e.g., definitions.

In 1994, the UN-Committee of Experts considered "that reformatting the Recommendations on the Transport of Dangerous Goods into Model Regulations that could be directly integrated into all modal national and international regulations would enhance harmonization, facilitate regular up-dating of all legal instruments concerned, and result in overall considerable resource savings for the Governments of the Member States, the United Nations, the specialized agencies and other international organizations". [Foreword of Orange Book, 1997]. At its nineteenth session, from 2 to 10 December 1996, the Committee adopted a new structure of its recommendations.

## STRUCTURE OF THE IAEA-REGULATIONS FOR THE SAFE TRANSPORT OF RADIOACTIVE MATERIAL

The current structure and format in the latest version of the IAEA-Transport Regulations No. ST-1, Edition 1996 [IAEA, 1996] is other than in the modal regulations of the national, intergovernmental and other international organizations. To facilitate the adoption of the ST-1 Regulations into the "Orange Book", the last TRANSSAC-Meeting [TRANSSAC, 1997] recommended that:

- in the near time frame, the Agency should proceed with developing a restructured
  presentation of ST-1 for use in the integration of those requirements into the regulations of
  the other international organizations. It is regonized that some problems may arise which
  will need to be addressed, such as consistent use of terminology and approaches;
- in the medium time frame, the Secretariat should explore the feasibility of joint sponsorship by the UN and the Agency of the UN's Orange Book and ST-1 and report back to TRANSSAC on these possibilities;
- the long-range option of wider integration and joint publication should be considered later as experience is gained in the earlier stages.

It was proposed that the IAEA Consultants would use the RID/ADR-Working Group draft format as the basis for integration of the ST-1 Regulations into the "Orange Book". The content will remain unchanged. Furthermore, all parties expressed, that the IAEA should play a leading role, both now and in the future, the review and revision of the Transport Regulations.

#### COMPARISON BETWEEN THE UN RECOMMENDATIONS AND THE LAND MODE AGREEMENTS FOR THE TRANSPORT OF RADIOACTIVE MATERIAL

Annexes 1 and 2 of this paper show the new structure both of the "Orange Book" and the adopted ADR-Draft. The tables of contents for the first six parts are very similar, and contain the provisions for the substances and articles, packagings and consignment procedures.

The essential part of this new structure is Part 3 "Dangerous Goods Lists". These lists contain all known dangerous substances/materials in a numerical as well as an alphabetical order. Parts 4 and 5 give the explanations of the tables from the Part 3. Part 6 addresses only the manufacturer/producer of the packagings, intermediate bulk containers and tanks. That means, the different parts of both, the modal regulations and the UN-Model regulations with its new structure are classified for special user groups. Part 7 of the "Orange Book" contains the "Provisions concerning transport operations". In general, development of the detailed provisions would be left to national, modal or regional authorities, but chapter 7.1 contains operational provisions that are applicable to all modes of transport [Orange Book, 1997]. In the ADR, the provisions concerning vehicle construction, equipment and operation are summarized in Annex B behind the first six parts. The same structure have the regulations for the rail mode.

### CONCLUSIONS

The new structure of the UN-"Recommendations on the Transport of Dangerous Goods" provides a good basis for all modal codes and regulations. The user friendly structure ensures that it is easier for the newcomer and for the specialists to understand the corresponding parts of the regulations. The work in the compliance assurance field is also easier to fulfill due to the individual responsibilities being more specifically defined.

In the future, the specialists of the member states can concentrate on the provisions for the substances / materials for all classes of dangerous goods within the UN-framework. The modal organizations can concentrate exclusively on the mode dependant parts of the pertinent regulations.

#### REFERENCES

International Atomic Energy Agency, Regulations for the Safe Transport of Radioactive Material, Safety Series No. 6, Vienna, 1990

International Atomic Energy Agency, Regulations for the Safe Transport of Radioactive Material, IAEA Safety Standards Series No. ST-1, Vienna, 1996

United Nations, Recommendations on the Transport of Dangerous Goods, Ninth revised edition, New York and Geneva, 1995

United Nations, Recommendations on the Transport of Dangerous Goods, Model Regulations, Tenth revised edition, New York and Geneva, 1997 International Atomic Energy Agency,

2nd Meeting of the Transport Safety Advisory Committee (TRANSSAC-II), Vienna, 10-14 March 1997

#### **Excerpt from:**

Annex 1

# UN RECOMMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS, MODEL REGULATIONS, 10TH REVISED EDITION, 1997

#### TABLE OF CONTENTS

# Part 1. GENERAL PROVISIONS; DEFINITIONS AND TRAINING

- Chapter 1.1 General provisions
- Chapter 1.2 Definitions and units of measurement
- Chapter 1.3 Training

### Part 2. CLASSIFICATION

- Chapter 2.0 Introduction
- Chapter 2.1 Class 1 Explosives
- Chapter 2.2 Class 2 Gases
- Chapter 2.3 Class 3 Flammable liquids
- Chapter 2.4 Class 4 Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases
- Chapter 2.5 Class 5 Oxidizing substances and organic peroxides
- Chapter 2.6 Class 6 Toxic and infectious substances
- Chapter 2.7 Class 7 Radioactive material
- Chapter 2.8 Class 8 Corrosive substances
- Chapter 2.9 Class 9 Miscellaneous dangerous substances and articles

# Part 3. DANGEROUS GOODS LIST AND LIMITED QUANTITIES EXCEPTIONS

- Chapter 3.1 General
- Chapter 3.2 Dangerous goods list
- Chapter 3.3 Special provisions applicable to certain articles or substances
- Chapter 3.4 Dangerous goods packed in limited quantities

# Part 4. PACKING AND TANK PROVISIONS

- Chapter 4.1 Use of packagings and intermediate bulk containers (IBCs)
- Chapter 4.2 Use of portable tanks

## Part 5. CONSIGNMENT PROCEDURES

- Chapter 5.1 General provisions
- Chapter 5.2 Marking and labelling of packages
- Chapter 5.3 Placarding and marking of transport units
- Chapter 5.4 Documentation
- Chapter 5.5 Special provisions

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Part 6.	REQUIREMENTS FOR THE CONSTRUCTION AND TESTING OF						
	PACKAGINGS, INTERMEDIATE DULK CONTAINERS (IBCS) AND						
	PURIABLE TAINS						
	Chapter	0.1	other than for Division 6.2 substances				
	Chapter	6.2	Requirements for the construction and testing of receptacles for gases				
	Chapter	6.3	Requirements for the construction and testing of packagings for Division 6.2 substances				
	Chapter	6.4	Requirements for the construction and testing of packagings for Class 7 material				
	Chapter	6.5	Requirements for the construction and testing of intermediate bulk containers				
	Chapter	6.6	Requirements for the construction and testing of portable tanks				
Part 7.	PROVISIONS CONCERNING TRANSPORT OPERATIONS						
	Chapter	7.1	Provisions concerning transport operations by all modes of transport				
	Chapter	7.2	Modal provisions				

# **Excerpt from:**

Annex 2

### RESTRUCTURED ADR - Basis 1997 -

### TABLE OF CONTENTS

Annex A: Provisions concerning substances and articles, packings and consignment procedures

GENERAL PROVISIONS, DEFINITIONS AND TRAINING						
Chapter	1.1	Scope and applicability				
Chapter	1.2	Definitions and units of measurement				
Chapter	1.3	Training of personnel				
Chapter	1.4	Role of the carrier and consignor				
Chapter	1.5	Derogations				
Chapter	1.6	Transitional measures				
Chapter	1.7	General provisions for Class 7				
	GENERA Chapter Chapter Chapter Chapter Chapter Chapter Chapter	Chapter 1.1 Chapter 1.2 Chapter 1.3 Chapter 1.4 Chapter 1.5 Chapter 1.6 Chapter 1.7				

# Part 2. CLASSIFICATION

- Chapter 2.1 General provisions
- Chapter 2.2 Class specific provisions
- Chapter 2.3 Test Methods

## Part 3. DANGEROUS GOODS LISTS

Chapter3.1IntroductionChapter3.2List of Substances in UN numerical order (Table A)Chapter3.3List of Substances in alphabetical order (Table B)Chapter3.4List of pesticides (Table C)Chapter3.5List of organic peroxides (Table D)

Chapter	3.6	List of flammable solids (Table E)			
Chapter	3.7	List of schedules of requirements for the transport of specified types of radioactive material consignments			
PACKING REQUIREMENTS (including use of packagings, IBCs, tanks, containers					
Chapter	A 1	Lise of nockesings and intermediate halls contained (IDCs)			
Chapter	4.1	Use of packagings and intermediate bulk containers (IBCs)			
Chapter	4.2	Use of tanks			
Chapter 4.5 Use of container or venicles					
CONSIGNMENT PROCEDURES					
Chapter	5.1	General requirements			
Chapter	5.2	Marking and labelling of packages			
Chapter	5.3	Placarding and marking of containers, tank-containers and transport units			
Chapter	5.4	Documentation			
Chapter	5.5	Special requirements			
REQUIREMENTS FOR THE CONSTRUCTION AND TESTING OF					
PACKAGINGS:		INTERMEDIATE BULK CONTAINERS (IBCs) AND TANKS			
Chapter	6.1	Requirements for the construction and testing of packagings (other than receptacles for gases and other than packagings for class 6.2 substances)			
Chapter	6.2	Requirements for the construction and testing of receptacles for gases			
Chapter	6.3	Requirements for the construction and testing of packagings for class 6.2 substances			
Chapter	6.4	Requirements for the construction and testing of packagings for Class 7 material			
Chapter	6.5	Requirements for the construction and testing of intermediate bulk containers (IBCs)			
Chapter	6.6	Requirements for the construction and testing of tanks			
Chapter	6.7	Specific provisions concerning tanks made from GRP			
Chapter	6.8	Requirements concerning the materials and construction of fixed welded tanks, demountable welded tanks, and welded shells of tank-containers for which a test pressure of not less than 1 MPa (10 bar) is required, and of fixed welded tanks, demountable welded tanks and welded shells of tank-containers intended for the carriage of deeply refrigerated liquefied gases of Class 2			
	Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter Chapter	Chapter3.6 ChapterPACKING REQU and vehicles for particularChapter4.1 ChapterChapter4.2 ChapterChapter4.3 CONSIGNMENT ChapterChapter5.1 ChapterChapter5.2 ChapterChapter5.3Chapter5.4 ChapterChapter5.5REQUIREMENTS PACKAGINGS; ChapterChapter6.1Chapter6.2Chapter6.3Chapter6.4Chapter6.5Chapter6.6Chapter6.7 Chapter6.8			

Annex B: Provisions concerning vehicle construction, equipment and operation

10.	GENERA	L PROV	ISIONS, DEFINITIONS AND TRAINING
	Chapter	10.1	Scope and applicability of Annex B
	Chapter	10.2	Definitions
	Chapter	10.3	Training of drivers
	[Chapter	10.4	Role of the carrier and consignor]
	Chapter	10.5	Derogations
	Chapter	10.6	Transitional measures

Part

Part 11. VEHICLE OPERATION

- Chapter 11.1 Vehicle crews and passengers
- Chapter 11.2 Documentation to be carried on board the vehicle
- Chapter 11.3 Supervision of vehicles
- Chapter 11.4 Parking provisions

[Chapter 11.5 Special requirements for radioactive material]

- Part 12. TRANSPORT EQUIPMENT
  - Chapter 12.1 Vehicle requirements
  - Chapter 12.2 Emergency equipment
- Part 13 PROVISIONS CONCERNING THE CONSTRUCTION OF VEHICLES INTENDED FOR THE CARRIAGE OF DANGEROUS GOODS AND THEIR APPROVAL
  - Chapter 13.1 Provisions concerning the construction of vehicles intended for the carriage of dangerous goods
  - Chapter 13.2 Provisions for the approval of vehicles

Chapter 13.3 Provisions for the type approval of base vehicles