Scope and Purposes of the IAEA Transport Information Collection System

INTRODUCTION

Three of the main objectives of the IAEA regulations for the safe transport of radioactive materials are:

(a) To limit radiation doses to transport workers and members of the general public to acceptable levels, under normal conditions of transport;
(b) To limit the risks from accidents to acceptable levels for transport workers and members of the general public;
(c) To enable consignments of radioactive materials to be transported internationally without unnecessary delay.

The regulatory requirements to meet these objectives prescribe limitations on the levels of radiation at the surface of packages and vehicles, in their immediate vicinity, and on the leakage rates from packages under normal transport conditions. These limitations take account of reasonable radiation exposure models for transport workers and members of the public. The risks from accidents are limited by prescribed standards designed to ensure that package shielding and containment are retained under accident conditions, simulated in package performance tests. These standards are also based on exposure models for transport workers and members of the public.

The individual and collective radiation doses received in a given period of time clearly depends on a variety of factors, including the number of packages transported, the sum of the transport indices and the average distance over which the packages are transported. The risk depends on the probability of occurrence of the various types of accidents and on the consequences of these accidents.

Some information on these points, including a number of direct measurements and assessments of individual and collective doses, was available to the groups of experts who established and updated the regulations. However, it was not extensive, and had been provided by a limited number of countries. Nevertheless, at the present time there is no reason to doubt that compliance with the regulations leads to an acceptable level of safety.

TRANSPORT OF RADIOACTIVE MATERIALS

IAEA FORM A

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Summary Questionnaire of Package Movements (1)
International Transport (report exports only)

Member State reporting: .....

Reporting period: .....

	ROAD			RAIL			INLAND WATERWAYS		
Package classification	Number of packages	Transport Index	(2) Distance miles/km	Number of packages	Transport Index	(2) Distance miles/km	Number of packages	Transport Index	(2) Distance miles/km
Exempt									
LSA or LLS (not full load)									
Type A									
Type B(U)									
TYPE B(M)									
Special arrangement									
Full load	(3)	(4)		(3)	(4)		(3)	(4)	

	SEA			AIR			POST	
Package classification	Number of packages	Transport Index	(2) Distance miles/km	Number of packages	Transport Index	(2) Distance miles/km	Number of packages	Distance miles/km
Exempt								
LSA or LLS (not full load)								
Type A								
Type B(U)								
Type B(M)								
Special arrangement								
Full load	(3)	(4)		(3)	(4)			

NOTES

(1) Report totals in all cases
(2) Report the sum of the distances from origins to destinations
(3) Report total number of full loads
(4) Report sum of radiation levels in mrem/h at 2 m from vehicle

STATISTICAL DATA ON PACKAGES											
Radiation Labelling Category	Exempt	I WHITE	II YELLOW	III YELLOW				Fissile Class			
TI			0–1	1–3	3–5	5–10	Full load > 10	Exempt	Class I	Class II	Class III
Number of packages											

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TRANSPORT OF RADIOACTIVE MATERIALS

IAEA FORM B

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Summary Questionnaire of Package Movements (1)
Domestic Transport (i.e. within your borders)

Member State reporting: .....

Reporting period: .....

	ROAD			RAIL			INLAND WATERWAYS		
Package classification	Number of packages	Transport Index	Distance miles/km	Number of packages	Transport Index	Distance miles/km	Number of packages	Transport Index	Distance miles/km
Exempt									
LSA or LLS (not full load)									
Type A									
Type B(U)									
TYPE B(M)									
Special arrangement									
Full load	(2)	(3)		(2)	(3)		(2)	(3)	

	SEA			AIR			POST	
Package classification	Number of packages	Transport Index	Distance miles/km	Number of packages	Transport Index	Distance miles/km	Number of packages	Distance miles/km
Exempt								(2)
LSA or LLS (not full load)								
Type A								
Type B(U)								
Type B(M)								
Special arrangement								
Full load	(2)	(3)		(2)	(3)			

NOTES

(1) Report totals in all cases
(2) Report total number of full loads
(3) Report sum of radiation levels in mrem/h at 2 m from vehicle

STATISTICAL DATA ON PACKAGES

Radiation Labelling Category	Exempt	I WHITE	II YELLOW	III YELLOW				Fissile Class			
TI			0–1	1–3	3–5	5–10	Full load > 10	Exempt	Class I	Class II	Class III
Number of packages											

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TRANSPORT OF RADIOACTIVE MATERIALS

Summary of Consignment Movements (1)

IAEA FORM C_1

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Member State reporting .. ..

Report exports and internal movements – do not report imports

Reporting period .. ..

Type of material	ROAD						RAIL						INLAND WATERWAYS					
	Number of consignments	Number of packages	Activity in C_i Total	Activity in C_i max/cons(3)	TI	Distance miles/km(2)	Number of consignments	Number of packages	Activity in C_i Total	Activity in C_i max/cons(3)	TI	Distance miles/km(2)	Number of consignments	Number of packages	Activity in Ci Total	Activity in Ci max/cons(3)	TI	Distance miles/km(2)
Plutonium																		
Other Transuranics																		
High-Level Wastes																		
Intermediate & Low Level Wastes																		
Sealed Sources (Med.)																		
Radiopharmaceuticals																		
Industrial Radiography																		
Other Industrial Sources																		
U & Th Ores & Concentrates																		
UF																		
UO																		
Other LLS & LSA																		
Unirradiated Fuel																		
Irradiated Fuel																		
Others (specify)																		

NOTES (1) Unless otherwise indicated report totals
(2) Report sum of the distances from origins to destinations of all consignments for each type of material
(3) Report maximum activity in any one consignment

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TRANSPORT OF RADIOACTIVE MATERIALS

Summary of Consignment Movements (1)

IAEA FORM C_2

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Member State reporting

Report exports and internal movements – do not report imports

Reporting period .. .. ..

Type of material	SEA						AIR						TOTAL					
	Number of consignments	Number of packages	Activity in C_i Total	Activity in C_i max/cons(3)	TI	Distance miles/km(2)	Number of consignments	Number of packages	Activity in C_i Total	Activity in C_i max/cons(3)	TI	Distance miles/km(2)	Number of consignments	Number of packages	Activity in C Total	Activity in C max/cons(3)	TI	Distance miles/km(2)
Plutonium																		
Other T ansu anics																		
High-Level Waste																		
Intermediate & Low Level Wastes																		
Sealed Sources (Med.)																		
Radiopharmaceuticals																		
Industrial Radiography																		
Other Industrial Sou ces																		
U & Th Ores & Concentrates																		
UF																		
UO																		
Other LLS & LSA																		
Unirradiated Fuel																		
Irradiated Fuel																		
Others (specify)																		

NOTES (1) Unless otherwise indicated report totals
(2) Report sum of the distances from origins to destinations of all consignments for each type of material
(3) Repor maximum activity in any one consignment

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TRANSPORT OF RADIOACTIVE MATERIALS

IAEA FORM D

Package Contents exceeding $10^2 \cdot A_2$ or, if in special form, $10^2 A$.

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Summary of Movements of Substantial Quantities

Member State reporting: ..... Report Exports and Internal Movements – Do NOT Report Imports Reporting period: .....

Radionuclide	Number of identical movements	Activity per consignment in Ci	Chemical/ physical form	Distances shipped – origin to destination				
				Road	Rail	Inland Waterway	Sea	Air
				km/miles	km/miles	km/miles	km/miles	km/miles

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The next comprehensive review of the IAEA transport regulations will consider, among other things, the extent to which they meet, under normal conditions, two of the basic requirements of the current ICRP dose limitation system: that all exposures to radiation be kept as low as reasonably achievable, and that no radiation doses to persons exceed the individual dose limits. The review will also consider an overall assessment of the risks arising from accidents during the transport and storage in transit of consignments of radioactive materials.

As a basis for this, and other subsequent reviews, as much information as possible should be available on, first, the present volume of traffic in radioactive materials by all modes of transport and, second, the occurrence and consequences of accidents during the world-wide transport of such materials. On the recommendation of an Advisory Group, the Agency has therefore initiated a system for collecting any data of this type that may now be available in Member States. In developing this system every effort will be made to avoid placing any undue burden on those States that are most heavily engaged in transport. The information collected will be compiled in a suitable form and stored in a computer file for retrieval as required. Summaries will be prepared for distribution to the groups of experts engaged in the review of the transport regulations and possibly to interested Member States.

The proposed system was reviewed and amended in some points by the Standing Advisory Group on the Safe Transport of Radioactive Materials at its first meeting in October 1978. It is described in more detail below.

INFORMATION ON THE WORLD-WIDE TRANSPORT OF RADIOACTIVE MATERIALS

In order to minimize the burden of collecting this data, it was decided that summary information covering an initial one-year reporting period would be requested. Accordingly, Member States are currently being asked to supply information on the present nature and extent of the transport of all types of radioactive materials within and between States, by all modes of transport. To the extent possible, this information is to relate to the year 1980, the chosen reporting period.

The choice of summary data and a one-year reporting period was considered a reasonable compromise between the desirability of obtaining exact information on a continuing basis and the necessity of having adequate, representative, world-wide data for use in reviewing the regulations.

The information to be provided by the Member States will be submitted on summary forms such as those shown in Figures 1, 2, 3 and 4. Any data that may be available on assessments of individual and collective doses to transport workers and members of the general public, resulting from the transport of radioactive materials, will also be collected. If necessary, consideration could be given at a later stage to collecting data relating to other agreed time periods.

INFORMATION ON ACCIDENTS OCCURRING DURING TRANSPORT

Information on the occurrence and consequences of incidents and accidents during the world-wide transport of radioactive materials will also form part of this data collection.

In order to avoid ambiguities, the words "incident" and "accident" are replaced by the term "reportable event", defined as any occurrence during transport or storage in transit which:

- subjects a package to conditions outside the normal design conditions or Type A test conditions;
- results in loss or theft of a package;
- results in the radiation exposure of persons or spread of contamination in excess of the relevant regulatory limits.

The usefulness of the data collected will be much greater if quantitative information on an event (e.g. the stresses and environmental conditions to which the package is subjected as a result of the event) can be included.

Although the collection of information on reportable events that have occurred during transport of radioactive materials will provide a good indication of the level of safety that has been achieved, it is recognized that the number of events is likely to be too small to permit the prediction, with reasonable accuracy, of the number and consequences of accidents that may occur in the future. For this purpose it would be useful to have additional information on the total number of accidents occurring in all modes of transport, including those involving other types of hazardous materials. Statistical information on total transport accidents is, therefore, also being requested from Member States. This information will relate to the same period as is covered by each batch of information sheets on reportable events in the transport of radioactive materials.

INFORMATION ON OTHER TOPICS

As part of its efforts to encourage the acceptance of approval certificates for Type B(U) package designs by all countries in which the Agency's transport regulations are applied, Member States are also being requested to supply copies of such certificates for Type B(U) packages which may be transported internationally or used outside the country of origin. The Agency plans to distribute, at regular intervals, a list of certificates for Type B(U), Type B(M) and Fissile Class Packages valid as of a given date, together with the names of the countries in which these packages are believed to be in use. It is also planned to collect, and store for retrieval, information on research programmes being undertaken in Member States on a variety of topics related to the design, construction and testing of transport packagings.