

# International Regulatory Control of the Transport of Radioactive Materials

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## INTRODUCTION

It was quickly realized that full benefit could not be derived from the developments in nuclear technologies unless radioactive materials of all types could be transported safely and without delay throughout the world. This could be done only if an essentially uniform system of regulatory control was applied to the international transport of all such materials on land, on the sea and in the air.

From the point of view of transport, radioactive materials have many characteristics similar to those of other potentially dangerous goods, such as flammable, corrosive or explosive substances, which have been carried safely for many years provided they were suitably packed and clearly defined handling procedures were followed.

## INTERNATIONAL TRANSPORT OF HAZARDOUS MATERIALS

The United Nations, acting through the Economic and Social Council (ECOSOC), has assumed responsibility for international negotiation to secure agreement on requirements which can form the basis for international and national regulations applicable to the transport of all types of potentially dangerous materials.

In 1959, ECOSOC adopted a resolution to the effect that the International Atomic Energy Agency, because of its technical competence and world-wide membership, should be entrusted with the elaboration of recommendations on the safe transport of radioactive materials. The IAEA responded to this resolution by convening panels of experts to study the technical and administrative aspects of such international transport. As a result of this study, the first edition of the IAEA Regulations for the Safe Transport of Radioactive Materials (Safety Series No. 6) was approved by the Board of Governors and published in 1961 as a component of the Agency's Safety Standards.

These regulations have been adopted by the United Nations as its recommendations for the transport of radioactive materials. They have also been adopted by a large number of individual Member States as the basis for their national regulations. In addition, they have been used as the basis for the regulations applicable to the States participating in the Council for Mutual Economic Assistance (CMEA). These States are Bulgaria, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania and the Soviet Union.

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## INTERNATIONAL AGREEMENTS AND REGULATIONS FOR DIFFERENT TRANSPORT MODES

In addition to the general recommendations of the United Nations, a number of agreements, regulations and recommendations related to the transport of hazardous materials, including radioactive materials, have been established by the competent bodies for the different modes of transport. In some cases, observance of the requirements is mandatory for the relevant mode. In all cases the IAEA transport regulations have been incorporated as the requirements for the transport of radioactive materials. They are, where appropriate, expanded to include specifications of segregation distances between packages and persons or photographic films.

Representatives of the organizations responsible for preparing these international agreements and regulations have taken part in all the detailed discussions leading to the establishment and updating of the IAEA transport regulations. This has undoubtedly facilitated the incorporation of uniform requirements. Some temporary inconvenience inevitably arises because the international regulations for the different modes of transport may undergo major reviews at different times. It is hoped that it may in future be possible to reduce still further any such temporary disparities through improved measures for co-ordination.

### (a) Transport by rail in European and some other countries

In 1890, the International Convention Concerning the Carriage of Goods by Rail (CIM) was established to remove disparities between national legislation which could impede international transport of goods by rail. The CIM now governs the carriage of goods by rail in twenty-six European countries and in Algeria, Iran, Iraq, Morocco, Syria and Tunisia. The railway systems of the Contracting States must accept any goods for transport, except clearly defined classes of dangerous goods, provided specified conditions are observed. Dangerous goods may also be accepted, provided that the conditions specified in Annex I to CIM, entitled: "International Regulations Concerning the Carriage of Dangerous Goods by Rail" (RID), are met. The RID, which is published in French and German by the Central Office for International Railway Transport, Berne, Switzerland, is revised at intervals of five years. The current edition was issued in 1977.

The dangerous goods covered by the RID are classified in accordance with the UN system and the IAEA transport regulations have been adopted as the requirements for radioactive materials. The current RID is in conformity with the 1973 revised edition of the IAEA transport regulations, with the addition of a number of changes of detail promulgated by the Director General in 1975. The RID also includes a table of minimum distances by which packages in the Categories II-YELLOW and III-YELLOW must be separated from packages containing photographic films, in terms of the sum of the transport indices of the packages in the consignment.

A system has been established for introducing agreed amendments in the RID during the five-year intervals between the major revisions.

### (b) Transport by road and by inland waterways in Europe

#### (i) Road

Four regional Economic Commissions have been set up within the UN system to recommend co-operative approaches to common problems by the countries in the different regions. In

the mid-1940s the Economic Commission for Europe (ECE) established an Inland Transport Committee (ITC) to consider transport matters in Europe. A Group of Experts within the ITC deals with the transport of dangerous goods. In 1957 the ECE adopted a European Agreement Concerning the International Carriage of Dangerous Goods (ADR) which entered into force in 1968 and has been updated several times since then.

The IAEA transport regulations have been adopted as the requirements for the transport of radioactive materials. The 1978 version of the technical requirements, set out in Annexes A and B to the ADR, are in conformity with the 1973 revised edition of the transport regulations, with the addition of the changes of detail promulgated in 1975.

In order to ensure continuing conformity between the RID and the ADR, joint meetings of the RID Safety Committee and the ITC Group of Experts are organized to consider matters that are common to both modes of transport. A system has been established for the simultaneous introduction of agreed amendments in the two agreements.

#### **(ii) Inland waterways**

The Inland Transport Committee of the Economic Commission for Europe is also developing a European Agreement on the International Carriage of Dangerous Goods by Inland Waterways (ADN). The Agreement, which is still in draft form, has adopted the IAEA transport regulations as the requirements for radioactive materials. It is in conformity with the 1973 revised edition with the addition of the changes of detail promulgated in 1975.

In the draft Agreement, formulae are provided for determining the minimum permissible distances between packages of radioactive materials and either living accommodation on the craft or service and other areas which may continuously contain undeveloped photographic film. These formulae are based on the sum of the transport indices of the packages and take account of the shielding effect of any intervening cargo. Restrictions are also placed on the radiation levels in occupied areas, at the gunwale and at hatchway covers.

#### **(c) World-wide transport by sea**

The Inter-Governmental Maritime Consultative Organization (IMCO) was established in 1959 as a specialized agency of the United Nations with Headquarters in London. IMCO is concerned entirely with maritime matters and one of its main objectives is to provide the necessary machinery for co-operation between governments on international requirements, codes of safe practice and guidelines applicable, in particular, to that part of the shipping industry that is engaged in international trade.

IMCO is responsible for the revisions of the International Convention for the Safety of Life at Sea (SOLAS), Chapter VII of which covers the transport of dangerous goods by sea. An IMCO Sub-Committee on the Carriage of Dangerous Goods prepared an International Maritime Dangerous Goods Code which comprises recommendations applicable to such transport. The IMCO Maritime Safety Committee approves and distributes revisions of the Code prepared by the Sub-Committee.

Dangerous goods are classified in the IMCO Code in accordance with the UN system and the IAEA transport regulations have been adopted as the requirements for radioactive materials. The current version of the Code was issued in 1977 and is in conformity with the 1973 revised edition, with the addition of the changes of detail promulgated in 1975.

Supplements containing amendments approved by the Maritime Safety Committee are issued at intervals of about one year.

The IMCO Code includes tables specifying the minimum permissible segregation distances of packages of radioactive materials from living accommodation or regularly occupied working areas on ships and from packages containing undeveloped photographic film. These distances are specified in terms of the sum of the transport indices of the packages. Nomographs are also provided for modification of these distances to take account of the presence of intervening cargo.

**(d) World-wide transport by air**

Two international organizations play a prominent part in regulating the transport of hazardous materials by air: the International Civil Aviation Organization (ICAO), a specialized agency of the United Nations, and the International Air Transport Association (IATA), a trade association representing scheduled airlines.

**(i) ICAO**

The Convention on International Civil Aviation (Chicago Convention) embodies regulations and procedures for ensuring the safety of air transport. ICAO is engaged in developing international agreement on specifications, comprising Standards and Recommended Practices, which are issued as Annexes to the Chicago Convention. It is located in Montreal, and has six regional offices each related to an appropriate group of Member States.

For nearly thirty years, the air transport industry, through IATA, developed, and obtained a large measure of international acceptance of, regulations for the transport of dangerous goods by air. Such regulations, however, do not carry the measure of policy control by Member States required to ensure full international acceptance and compliance. For this reason, the ICAO Air Navigation Commission initiated in 1975 a study of the international carriage of dangerous goods by air and established a Dangerous Goods Panel of Experts for the development of appropriate Standards and Recommended Practices, together with supporting Technical Instructions. It was agreed that the work of the panel should be based on the recommendations of the UN Committee of Experts on the Transport of Dangerous Goods and the IAEA transport regulations, and should take full account of the IATA Restricted Articles Regulations. In 1978 the panel prepared a new draft Dangerous Goods Annex to the Chicago Convention together with related Technical Instructions. The Air Navigation Commission is now reviewing the draft Annex in the light of comments by Member States and international organizations.

**(ii) IATA**

The International Air Transport Association (IATA), an association representing airlines licensed to provide scheduled air services by governments that are eligible for membership of ICAO, has issued and reviewed annually the IATA Restricted Articles Regulations (RAR). These regulations specify the special packing and handling required for listed materials, including radioactive materials, which would be unsuitable for transport by air unless suitably packed. The transport of certain other listed articles is forbidden.

The IATA regulations are binding for IATA member airlines. The current edition of the RAR includes two sets of regulations for the transport of radioactive materials. The first is in

conformity with the 1973 revised edition of the IAEA transport regulations, with the addition of the changes of detail promulgated in 1975. The second is in conformity with the 1967 edition of the regulations. Tables are included which specify the minimum permissible distances, related to the sum of the transport indices, from the surfaces of the packages to the inner floors of passenger cabins and flight decks and to the surfaces of packages containing undeveloped photographic film.

**(e) International transport by post**

The Universal Postal Union (UPU), a specialized agency of the United Nations located in Berne, Switzerland, is concerned with preparing any amendments to the Universal Postal Convention and the Detailed Regulations for Implementing the Convention. Under this Convention, radioactive materials in which the activities do not exceed one-tenth of the upper limits for items exempt from the packaging, labelling and stowage requirements of the IATA transport regulations may be transported internationally by post provided certain relatively simple additional procedures are followed.

### **NATIONAL TRANSPORT REGULATIONS**

At this time, most of the Member States engaged in the transport of radioactive materials have adopted regulatory control systems based on the IAEA transport regulations. In the case of international transport, the date of adoption of requirements based on the current version of the IAEA regulations depends on the date of their incorporation by the relevant international competent body in the agreements or regulations applicable to that mode of transport.

The implementation of the administrative requirements at national and international levels is helped by the discussions of the Radioactive Transport Study Group (RTSG). The RTSG is an informal group of representatives of the competent authorities of Member States which are engaged to a substantial extent in the international transport of radioactive materials. It was established under the aegis of the IAEA in 1968 and meets at intervals of about eighteen months. Summaries of national regulatory requirements and problems of mutual interest arising in their application to international transport are fully discussed.