

**Dangerous Goods in Europe**  
**- ADR, RID, IMDG Code, ICAO-TI and ADNR**  
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## **1. Introduction**

In 1796 in Europe the first forms of dangerous goods transport (gunpowder) regulations were published. Radioactive material at that time was not transported. Since this time, in Europe and especially in the European Union the transport of dangerous goods (including radioactive material) has become a very important safety issue.

Since the beginning of 2000, the restructuring of regulations governing all modes (truck, rail, sea, inland waterway and air) of dangerous goods transportation has been concluded. Harmonization on the basis of the Recommendations of the United Nations (“orange book”) and the Int. Atomic Energy Agency (IAEA), (IAEA Recommendations) has taken place throughout the transport mode spectrum. These of which are pending not only for international transport but for all national traffic within the borders of the of European Community (EC) member countries.

Now the harmonization process, and the process of simplification begun in 2001, the so-called structure reform have both been concluded.

## **2. Regulations**

All told, there are today in Europe 2 international recommendations, 5 international regulations with (in parts) domestic applicability in some countries, and 7 directives of the European Community (EC). In Germany, in addition to the above listed, there is applicable: 1 domestic Act, 4 larger domestic rules, 4 smaller rules as well as some provisional or immediate orders as well. Finally, there are guidelines and other notices, which puts the number of pages of German regulations to some 5000 or more.

### **2.1 Inland navigation**

Let me mention, that the “Agreement on the Transport of Dangerous Goods on the Rhine” (ADNR) with its appendices A and B has already been agreed upon by the “Central Commission for Navigation on the Rhine” in Strasbourg and that it is applicable to the Rhine river– the world’s busiest inland waterway today.

Whereas the ADNR regulates the Rhine river, the future “European Provisions Concerning the Int. Carriage of Dangerous by Inland Waterway” (ADN) will cover all European inland waterways.

The work for ADN was carried out by the UN “Economic Commission for Europe” (UNECE) in Geneva and was finished in May of 2000. The ADN should come into force in 2005 (?).

### **2.2 Rail transport**

The opening of railways goes back to the beginning of the 19<sup>th</sup> century. Rail transport had a revolutionary effect on transport and allowed land-based exchange of goods to reach an intensity unknown before.

Early on in rail transport, the carriage of dangerous goods at the international level was dealt with by the “International Regulations concerning the Carriage of Dangerous Goods by Rail” (RID). This, of which is found in Appendix B of the “Uniform rules concerning the contract for international carriage by Rail” (CIM). All of the above is found in Annex I of the “Convention concerning international carriage by rail” (COTIF). COTIF has existed in various amended forms since 1890, and thus was able to celebrate its 100<sup>th</sup> “anniversary” 11 years ago.

The provisions of RID pointed the way for the regulations that were added later on in (ADR and ADNRR).

### **2.3 Road transport**

Since 1957 cross-border road transport in Europe has been regulated by the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR for short). It has now been ratified by 36 European states.

Development work on ADR is conducted by the Working Party 15 (WP.15) under the auspices of the UN/ECE in Geneva, Switzerland. Because ADR and RID are almost identical, at least as far as substances, packaging and labeling are concerned, both regulatory frameworks are jointly developed at the so-called “joint sessions” in Geneva and Berne, Switzerland.

In 2001, hazard class 7 (Radioactive Substances) of ADR and RID were completely revised. The basis for these regulations for the carriage of radioactive materials were the 1996 IAEA-Recommendations (Safety Series No 6).

### **2.4 Maritime Transport**

Increasing use of certain dangerous goods after World War II had caused the carriage of these goods by sea to grow substantially. Carriage by sea of dangerous goods therefore was in need of regulation to protect seafarers and ships from harm. This carriage is the subject of Chapter VII of the 1974 (1960) International Convention for the Safety of Lives at Sea (SOLAS). The convention contains the basic provisions; they were last amended in 2001.

In the meantime some 70 of the world’s nations have introduced the International Maritime Organization (IMO), Dangerous Goods Code (IMDG Code) and made it legally binding.

Within the framework of the SOLAS convention and the International Convention on Marine Pollution (MARPOL) further codes are being adopted; the Bulk Chemicals Code (BCH-Code) is just one example and also the Irradiated Nuclear Fuel Code (INF-Code).

The 1996 edition of the IAEA-Recommendations Safety Series No 6 was put into force by the IMO in 2001.

### **2.5 Air Transport**

A special expert staff team of the “International Air Transport Association” (IATA) has drawn up specific provisions for the carriage of dangerous goods by air. These “IATA-Restricted Articles Regulations” (IATA-RAR for short), as they used to be called, were continually brought up-to-date (normally on an annual basis) based upon the latest technical developments in industry and air transport.

Since 1976 experts at governmental level have been concerned with the carriage of dangerous goods on behalf of the International Civil Aviation Organization (ICAO). ICAO has passed Annex 18 to the Chicago Convention on Civil Aviation which contains fundamental provisions for the carriage of dangerous goods by air. Based on this Annex 18, the details are dealt with by the “ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air” (ICAO-TI). Since the 1<sup>st</sup> of January, 1984 ICAO Member States were required to adopt the ICAO-TI. A new version of the ICAO-TI is issued every other year.

In the meantime, IATA has adopted the contents of the ICAO regulations for its work and renamed it to “IATA – Dangerous Goods Regulations” (IATA-DGR).

The 1996 edition of the ICAO Recommendations Safety Series No 6 has been put into force since the 1<sup>st</sup> July 2001.

### **3. Recommendations of the United Nations and the International Atomic Energy Agency**

#### **3.1 United Nations**

The United Nations (UN) has been concerned with the carriage of dangerous goods since 1956. The UN issues recommendations which find their way into the respective regulations and rules on the carriage of dangerous goods (Fig. 1). The latest UN recommendations have been published in 2001 under the title “Recommendations on the Transport of Dangerous Goods – Twelfth revised edition” prepared by the “Committee of Experts on the Transport of Dangerous Goods”. As this publication comes with an orange cover, experts generally refer to it as the “orange book”.

The UN recommendations, first of all, divide goods into hazard classes. They further contain a list of goods most commonly carried, each of which has been assigned a UN number. This UN number, by the way, is the number that can be seen on the lower half of the orange-colored warning panels on road tank vehicles and rail tank wagons on packages or in the transport document. The recommendations also contain a compilation of specimen risk labels used worldwide in dangerous goods transport. Other contents include among others:

- requirements for dangerous goods packaging
- fixing of test criteria for the classification of dangerous goods
- subdivision of dangerous goods for degree of hazard (“packaging groups”)
- provisions for Radioactive Materials.

#### **3.2 International Atomic Energy Agency**

The Vienna-based International Atomic Energy Agency (IAEA) is the appropriate authority for carriage of radioactive goods. Since 1961 the IAEA has published the “Recommendations for the Safe Transport of Radioactive Material”. The latest revision of the IAEA recommendations, the work towards which was begun in June 1991, was finished in 1996.

Again, it should be pointed out that neither the UN recommendations nor the IAEA recommendations are regulations in their own right but, in order to obtain the power of law, require incorporation into the respective transport regulations and the ratification thereof.

### **4. European Community (EC)**

Since the beginning of 1993, 15 countries of the European Union have formed a free market. Cabotage, which means that a carrier may render transportation services within another State. One precondition for this free market is that throughout the European Union domestic and transboundary carriage are governed by the same regulations and subject to the same rules for control.

The “Commission of the European Communities”, Directorate General VII, considered this as another reason to issue directives for the carriage of dangerous goods. At present there are two directives for road transport, known as “ADR Framework Directive” and another for the rail transport, known as “RID-Framework Directive”. Basically, it states that international ADR regulations also apply to domestic carriage within the EU Member States. This ADR- and RID-Framework Directives were promulgated in the Official Journal (OJ) of the European Communities at the end of 1994, and the Member States must have incorporated these as of January 1, 1997.

Similar directives are in preparation for inland waterways navigation, the drafting of a corresponding directive is under consideration.

As soon as such a directive is published the EU member countries are no longer free to set their own rules. In addition, they may apply EU law only to their domestic transport. As far as road transport is concerned, this means:

- One ADR version (the original) for transboundary traffic shall come from Geneva.
- An additional, EU version (translated into every EU language by the European Community) for domestic traffic shall come from Brussels.

In this case, the European Commission has the task of translating the ADR into 12 languages of the EU. Of course, the same applies to rail transport and, perhaps in the future, to inland navigation too.

For maritime or air carriage there are no EU requirements so far.

## 5. Harmonization

The problem was, transport in general has become more and more modal-interdependent and the regulations governing the individual modes have not kept pace with this development. Parallel systems of classification, differing expectations on packaging and their corresponding documentation etc. to name just a few of the difficulties confronted. That one was even able to successfully transport dangerous goods combining differing transport modes and then to possibly ship overseas up till now was only made possible by the practitioners and their abilities to after all, find ways and possibilities to process the planned shipment.

The transport mode interdependent harmonization process first began with the activities of the United Nations with the so-called „orange book“ in 1956 and the International Atomic Energy Agency and the IAEA Recommendations in 1961. This work was in most part concluded in 2000 which included: uniform hazard classes, the same system of classification, standardized flash point limits, uniform testing requirements for packaging and world-wide agreed transport regulations for the movement of radioactive material.

**One can proudly say: at the beginning of 2000 the dangerous goods regulations for the individual transport modes in principle were harmonized with one another.**

Now one looks further down the road, the next goal is to harmonize additionally the different legal areas, especially the Dangerous Goods, Dangerous Substances and Environmental Protection legislation with one another. This was stated in the agreement from the conference in Rio de Janeiro in 1992. The work continues with quite positive interim results. The "Global Harmonized System" (GHS) should could come into power in 2010, assuming that one can come to an agreement.

## 6. Simplification

The past regulations were established according to the requirements of each specific transport mode, thus the form of presentation differed:

- RID, ADR und ADNR so called "marginals"
- IATA-DGR/ICAO-TI so called "system of tables"
- IMDG Code so called "loose leaf system".

When one looks at all three systems, one is quickly of the opinion that the system of tables is the most advanced.

There are naturally „dangerous goods experts“ who, over the years have become so used to the system of marginals that they would not like to do without it. These experts know immediately that, the marginal 10-011 ADR has to do with limited quantities and the marginal 10-385 ADR deals with written instructions.

The IMDG Code is also easily understood with it's loose leaf system. The problem is however that one then requires several binders to store the 3,500 pages of material.

Going back somewhat in the history, one ascertains that in the 70's that a working group in Germany had already come to this same conclusion, that the system of tables really is the best form. Never the

less, the results of this work were able to influence the foundation of the ICAO-TI in 1984 and later the work of structure reform we have today.

The work of structure reform began in 1991. At this time Prof. Dr. Schulz-Forberg (BAM, Berlin) was engaged, at first to perform the relevant work of preparation. This task began originally limited to the ADR (road), at a later time then extended to include RID (rail) as well and one developed the new structure together further in the so-called “joint meetings”. At a further point in time the air transport mode (ICAO-TI), IMDG Code (Ocean) and the Central Commission for Navigation on the Rhine CCNR/(ADNR) also took up the work of restructuring.

To this work came the so called „orange book as well which contributing to the direction of the new structure for the future use of all modes of transport regulations world wide, also incorporating the accepted adaptations to the system. Both the 10<sup>th</sup> and 11<sup>th</sup> editions already contained the interim accomplishments of the new structure.

### 6.1 What is new?

The following text is limited to the restructured format of the ADR.

ADR is divided into 9 different parts (appendix).

Perhaps the most important section is **part 3**, here the dangerous goods list is found, ordered according to the assigned UN number. Following each substance is listed in the corresponding row how the substance is classified, which hazard label is applied, and which type of packaging is necessary, etc.. In this manner, one can with the dangerous goods list immediately recognize which regulations are to be adhered to for the reciprocal substance, an immense simplification in comparison with the former systems.

New and sensationally good is part 1, which deals with “terms”. The explanation of the terms here also has a legal character, which means that when the “loader” or the “carrier” is defined then this definition is legally binding.

Clearly stated furthermore, using the example, the meaning of the term “sender”, standardized in ADR and then looking at the individual national legislation (in Germany the “Code of Commercial Law” HGB) of the member countries, this term would no longer have any more dangerous goods legislative meaning. One must however wait and see if this immense attempt will actually be successful.

**All parts of all the individual transport mode specific legislations are all the same**, other than differences in part 7 (operations), 8 (training, equipment) and 9 (construction regulations) due to the differing mode specific requirements. This is logical, as a dangerous goods driver (road) has different conditions than the driver of a locomotive (rail) and an inland waterways vessel is built differently than a truck.

Important is also that part 3 deals with limited quantities regulations and exemptions. All exemptions which in the past were found either in the “list of substances” (so called “a” marginals) or as limited quantities in Appendix B shall both be established in the future in this section. The table of limited quantities (at present Marginal 10-011 ADR) would be better presented, also here a further simplification!

The European „safety advisor“ (dangerous goods safety advisor in Germany) will be found again in the future in RID/ADR. The European Commission shall hand over it’s responsibility in this matter to the UN/ECE and to the “Central Office for the International Carriage by Rail” (OCTI). This action now establishes the obligation in 36 European countries (ADR agreement) as well as all the RID contracting countries to appoint a safety advisor (dangerous goods). The obligation to prepare an accident report by serious accidents or incidents is also taken over from the EC directive for safety advisors.

The report is also to be sent further to the Secretariat of the UN/ECE for examination and further development of the regulations.

Specific details regarding the construction of the individual parts are found in the appendix

## **6.2 Interim arrangement**

The new ADR (and also RID) came into power on the 1st of July 2001. Announcement in Germany was initiated at the end of June 2001.

As one now knows today, that perhaps in Germany a timely announcement would have taken place, this however would most likely not have been the case from the other ADR contracting countries, it was therefore chosen to grant a generous transitional period of 18 months (exception: RAM 6 months)!

In these 18 months one can apply the old (ADR 99) and the new legislation (restructured ADR 2001). However, the routine changes, which automatically arrive for the 1st of January 2001, will be applied only to the restructured ADR.

The other transport modes have in the mean time also set their dates for coming into power:

ICAO-TI: 1<sup>st</sup> of July 2001

IMDG: 1<sup>st</sup> of January 2001 + 12 Months

ADNR: 1<sup>st</sup> of January 2003 (no transitional period)

## **7. Summary**

In summarizing it can be said that, the dangerous goods regulations were transport mode interdependently harmonized as of January 2001 and now the simplified form also transport mode interdependent shall come in the near future.

All of the affected persons must ardently adjust, then those in the past who found there way well through the system of marginals shall have to think differently in the future.

It is also to be expected that, in the beginning phases many inconsistencies shall occur, we all must think and work together – even you!