

## **Article on Dangerous Goods for the Magazine Safety and Security International**

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July 2008

Dangerous goods are often seen as a very special and mysterious category of goods, to which the public is rarely exposed. The term itself inspires fear, and any accident or even minor incident involving such goods immediately entails reactions from the media and public opinion. In fact, dangerous goods are produced and transported in very large quantities and they cover an extensive range of products which present risks for the population in general, property and the environment. These risks are present at the stage of extraction, production, transport, and use at the workplace and when handled by consumers. Transport is a delicate part of the lifecycle of such goods, since it, or part of it, takes place in areas where people and the environment are particularly exposed.

A number of catastrophic accidents in the past have prompted governments to develop regulations intended to eliminate, or to minimize to the extent possible, such risks. Nevertheless, due to the economic importance of dangerous goods and to the importance of international transport, it has been necessary to discuss these regulations internationally in order to ensure a high level of safety acceptable to all countries and authorities responsible for different modes of transport while making international and multimodal transport possible through the harmonization of transport conditions.

In 1953, the United Nations Economic and Social Council (ECOSOC) decided to create a Committee of Experts on the Transport of Dangerous Goods. The mandate of the Committee was to elaborate recommendations addressed to all governments and international organizations concerned with the safe transport of dangerous goods that would allow the uniform development of national and international regulations governing the various modes of transport.

These recommendations are contained in the “UN Recommendations on the Transport of Dangerous Goods, Model Regulations”, also known as the “Orange Book”, which is updated every two years. They cover all necessary provisions concerning the classification and identification of dangerous goods; their packing conditions, including standards for packaging and tank construction; labelling, marking and placarding of packages and transport equipment; and transport documentation.

Although the recommendations apply to all modes of transport, they nevertheless remain flexible enough to accommodate any special additional requirements that have to be met by specific modes of transport, or at national or regional level.

The recommendations are implemented through the following international legal instruments:

- The “International Maritime Dangerous Goods Code” (IMDG Code), for maritime transport;
- The “ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air” (ICAO TI), for air transport;

- The “European Agreement concerning the International Carriage of Dangerous Goods by Road” (ADR), for road transport;
- The “European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways” (ADN), for inland waterways transport;
- “Regulations concerning the International Carriage of Dangerous Goods by Rail” (RID) (Appendix C of the Convention concerning international carriage by rail (COTIF)), for rail transport.

Although all these regulations, based on the UN Recommendations, are primarily intended to ensure a high level of safety and to facilitate international and multimodal transport, they also address security.

However, some safety requirements such as those concerning construction of packagings and transport equipment, training of transport workers etc., contribute also to security. ADR addresses the supervision of vehicles, in particular those carrying explosives but also those carrying highly dangerous substances above certain quantities, including supervision during loading and unloading and on parking sites.

After 11 September 2001, many governments realized that it had become necessary to consider much more closely how to prevent potential terrorist attacks. Transport of dangerous goods was rapidly identified as one of the areas where appropriate international action should be taken urgently. As a result, the UN ECOSOC Sub-Committee of Experts on the Transport of Dangerous Goods issued, already in December 2002, recommendations as regards the security measures or precautions that should be provided through transport of dangerous goods regulations in order to minimize the risk of theft or misuse of dangerous goods that may endanger persons or property.

These security provisions consist of:

- General provisions applicable to all dangerous goods: the security of areas used for the temporary storage during carriage of dangerous goods; identification of carriers and their staff; training; registration of valid training certificates;
- Provisions applicable to the so-called “high consequence dangerous goods” i.e. those which have the potential for misuse in a terrorist incident and which, as a result, could produce serious consequences such as mass casualties or mass destruction.

The indicative list of high consequence dangerous goods include:

- Explosives (with some exceptions for the less dangerous ones);
- Flammable gases in bulk (e.g.: butane, propylene, liquefied petroleum gases, ethylene, propane);
- Toxic gases in bulk (excluding aerosols) (e.g.: chlorine, phosphine, dichlorosilane, arsine, ammonia anhydrous);
- Flammable liquids with a flash point below 23 °C, in bulk (e.g.: petroleum crude oil, liquid hydrocarbons, paints, toluene, alcohols);
- Desensitized explosives (e.g.: dinitrophenol, wetted; trinitrotoluene (TNT), wetted; trinitrobenzene, wetted);

- Pyrophoric substances, in bulk (e.g.: white or yellow phosphorous (dry, under water or in solution); pentaborane);
- Substances which in contact with water emit flammable gases (only the most dangerous, i.e. packing group I), in bulk (e.g.: trichlorosilane, lithium, potassium);
- Oxidizing liquids (only the most dangerous, i.e. packing group I), in bulk (e.g.: potassium peroxide, perchloric acid);
- Perchlorates, ammonium nitrate, ammonium nitrate fertilisers and ammonium nitrate emulsions, suspensions or gels, in bulk;
- Toxic substances (only the most dangerous, i.e. packing group I) (e.g.: arsenic acid, motor fuel anti-knock mixture, liquid tear gas substances, pesticides, liquid toxins extracted from living sources);
- Infectious substances of Category A, i.e.: infectious substances affecting humans and infectious substances affecting animals only (e.g.: Bacillus anthracis (in cultures only), Ebola virus, Hepatitis B virus (in cultures only), Human immunodeficiency virus (cultures only), Yersinia Pestis (cultures only), Foot and mouth disease virus (cultures only));
- Radioactive material above certain quantities, in Type B(U), B(M) or C packages;
- Corrosive substances (only the most dangerous, i.e. packing group I) in bulk (e.g. sulphuric acid, fuming).

*Nota: "In bulk" means transported in quantities greater than 3000 kg or 3000 l in tanks or bulk containers.*

*For packing purposes, many substances are assigned to three packing groups (I, II and III) in accordance with the degree of danger they present (high, medium and low danger, respectively).*

The provisions applicable to these "high consequence dangerous goods" require special measures to be applied to prevent theft of the vehicles and cargoes. Arrangements between consignors, carriers and any other participants in the transport operation have to be made for adopting, implementing and complying with a security plan, which shall comprise at least the following elements:

- (a) Specific allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;
- (b) Records of dangerous goods or types of dangerous goods transported;
- (c) Review of current operations and assessment of vulnerabilities, including inter-modal transfer, temporary transit storage, handling and distribution as appropriate;
- (d) Clear statements of measures, including training, policies (including response to higher threat conditions, new employee/employment verification etc.), operating practices (e.g. choice/use of routes where known, access to dangerous goods in temporary storage, proximity to vulnerable infrastructure etc.), equipment and resources that are to be used to reduce security risks;
- (e) Effective and up to date procedures for reporting and dealing with security threats, breaches of security or security incidents;
- (f) Procedures for the evaluation and testing of security plans and procedures for periodic review and update of the plans;

- (g) Measures to ensure the security of transport information contained in the plan; and
- (h) Measures to ensure that the distribution of the transport information is limited as far as possible, without precluding provision of transport documentation as required by the applicable regulations).

These new security provisions are contained in Chapter 1.4 of the UN Model Regulations. They have been included in the IMDG Code (for maritime transport) and the ICAO TI (for air transport) with the reservations nevertheless that:

- (a) For maritime transport, they remain recommendations to governments, that national competent authorities may apply additional security provisions, and that the relevant security provisions of Chapter XI-2 of the SOLAS 74 Convention and of the International Ship and Port Facility Security (ISPS) Code apply;
- (b) For air transport, they supplement (and do not supersede) the provisions of Annex 17 (Security) of the Convention on International Civil Aviation and of the ICAO Security Manual for Safeguarding Civil Aviation against Acts of Unlawful Interference.

The provisions of Chapter 1.4 of the UN Model Regulations were also introduced in Chapter 1.10 of ADR and RID for mandatory application to international (and domestic in EU countries) transport by road and rail as from 1 July 2005, with some minor adaptations. They were also included in ADN, but their effective date of mandatory application for international carriage by inland waterways will be 28 February 2009 (following entry into force of ADN on 29 February 2008), although some Governments have already taken steps to implement them at national level (notably on the Rhine through ADNR).

The European Commission is currently carrying out a study on the effective implementation of these measures in the EU member States, their practicability and problems encountered.

More information about transport of dangerous goods regulations (including the text of the “UN Recommendations on the Transport of Dangerous Goods”, “ADR” and “ADN”) is available at: <http://www.unece.org/trans/danger/danger.htm>

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