

## MAJOR SIMILARITIES AND DIFFERENCES IN THE CIVIL AND MILITARY ASPECTS OF THE TRANSPORT OF DANGEROUS GOODS

### A VESZÉLYES ANYAGOK SZÁLLÍTÁSA POLGÁRI ÉS KATONAI ASPEKTUSAINAK FŐBB AZONOSSÁGAI ÉS KÜLÖNBÖZŐSÉGEI

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#### Abstract

*2017 is considered a jubilee in several respects. Firstly, ADR (International Road Transport of Dangerous Goods) – proclaimed 30 September 1957 – became 60 years old, and secondly, the UN-ECE Internal Transport Committee celebrated its 70th birthday. On this occasion, I considered it fitting to write a separate article reviewing the 2017 changes in ADR, and further exploring the military aspects of the regulation of hazardous freight transport, in accordance with my research field.*

**Keywords:** ADR, dangerous goods transport, military dangerous goods transport, explosives

#### Absztrakt

*A 2017-es év több szempontból is jubileuminak számít, egyrészt 60 éves az 1957. szeptember 30-án kihirdetett ADR (Veszélyes Áruk Nemzetközi Közúti Szállításáról szóló Európai) Megállapodás, másrészt 70 éves az ENSZ-EGB Belső Szállítási Bizottsága. Ezen alkalomból is érdemesnek tartottam egy önálló cikk megírását, amely áttekinti az ADR 2017-es változásokat, valamint kutatási területemhez illeszkedve tovább vizsgálja a veszélyes áruszállítás szabályzásának katonai aspektusait.*

**Kulcsszavak:** ADR, veszélyes áru szállítás, katonai veszélyes áru szállítás, robbanóanyagok

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## INTRODUCTION

The EU DIRECTIVE 2016/2309 on the fourth adaptation to the Annexes to Directive 2008/68 / EC of the European Parliament and of the Council on the inland transport of dangerous goods relates to the transitional period and the deadline for the publication of national regulations. In a classical sense, only the term "Member State" is replaced by the term "Contracting Party".

From a domestic point of view, the Act CIII of 2017 amending certain laws related to the transport of dangerous goods Act No. 178/2017 on the Publication of Annexes A and B to the European Agreement on the International Carriage of Dangerous Goods by Road and on the Application of Certain Aspects of Domestic Application (VII.5.) of the Hungarian Government, that is to say, ordering the application of ADR 2017 from the 2017.07.06 deadline. Of course, the 61/2013 on Domestic Application (and Derogations) (X. 17.) MND (Ministry of National Development) regulation is also in force, and its application should not be ignored by experts in the field.



1. figure ADR contracting parties as of June 2013 [1]

## MAJOR CHANGES IN REGULATION

The changes in the 2017 regulations amount to nearly 150 pages which counts as a lot even compared with the regular biennial changes. In this article, I will only present the changes that I consider to be of critical military importance within the shipping chain's traditional mechanisms.

The result of the rapid development of the chemical industry continues to appear in the regulation, and, as a result, nine new UN numbers have been added to the former ones. Currently, the UN 3534 number is the last classified dangerous substance, which is 38 more than in 2011. New material identifiers include rocket engines, internal combustion engines and polyester resins. As a result of the successful lobbying of vehicle manufacturers', internal combustion engines received new UN numbers so that now items previously classified as vehicles are well separated, to the satisfaction of both carriers and controllers. [2,3,4,5]

The investigative consequences of the 2012 accident of German container vessel MSC Flaminia significantly affected the 2017 changes of ADR. This container ship was 300 meters long and had a capacity of 6750 containers, but on the day of the crash, only 2876 containers were on board. On July 12, 2012, the boat from the United States to Belgium caught fire and exploded, leaving the crew to leave the deck. On July 18, another explosion occurred, causing a massive fire, and the firefighting lasted for weeks. The ship then was towed to Wilhelmshaven, a nearby port of Hamburg sizable enough to accommodate such a large vehicle. As a result of the accident, two sailors died and three were injured. The materials involved were polychlorinated biphenyl (PCB), dioxane, isopropylamine, nitromethane and calcium hypochlorite. A group of experts from several countries began work to find out about the environmental impacts and the hazardous reactions of substances on board of the ship. According to studies, almost all of the 2876 containers shipped have been damaged and leaks have been found in many containers. Based on the findings of these studies, several – otherwise less hazardous – substances have undergone a polymerase process due to improper loading and high temperatures, leading to explosion and fire. [6,7]

As a result of this accident, the name of ADR Class 4.1 has been changed to Flammable Solids, Self-reactive Substances, Polymerizable Substances and Polluted Solid Explosives. The term "polymerization", basically refers materials which – without stabilization – tend to undergo fervent exothermic reactions even under normal conditions of transport, resulting in the formation of larger molecules aka. polymers. As a result of this, Self-accelerating Polymerization Temperature has emerged as a new concept and term. This concept asserts that materials that are susceptible to polymerization can only shipped when provided with temperature stabilization. Of course, due to the change in the name of Class 4.1 and the new concepts described, the Kemler numbers have also changed.

An important change in the approval process for vehicles is the disappearance of the OX certification which applied to special tankers transporting stabilized hydrogen peroxides.

Also a very important change is the introduction of the new 9A badge for lithium batteries, given their ever-expanding trade. More and more accidents happen as a result of overheating due to charging these lithium batteries. In 2017, in France, a small electric motorcycle exploded after being charged for eight and a half hours, causing two people to be injured. [8] Much of the military transport of explosives in EXII / EXIII trucks is affected by the fact that the trucks are only capable of transporting a smaller quantity of cargo.

In addition, packages of materials or objects of Class 1 only and bearing labels 1, 1.4, 1.5 or 1.6 are to be put together, according to the base table, irrespective of whether any other hazard labels are required. The written instruction has changed every time in the last eight years. Due to the materials mentioned above that are prone to polymerization and the newly published 9A label, it has also changed in 2017, and has been in force since the date of publication, without a transitional period. [9,10,11,12]

## **EXPLOSION AT THE FIREWORKS BUILDING DENMARK, KOLDING**

At about 14 o'clock, a fireworks store (2000 tons) struck a 40-foot long container, due to a faulty handling of a box filled with fire extinguishers. The fire spread quickly in the container and spread to the fireworks stored outside on pallets. The company initiated its internal emergency plan and evacuated the facility's staff. A 1km security zone was established and local residents were also evacuated. Residents in the neighborhood were asked to stay in a closed place. Despite some of their intervention difficulties (smoke, noise, water supply, and defective fire hydrants), firefighters could manage to cool the firework containers next to the locked, burning repositories. An explosion occurred at 15:25, causing one fireman to die and injuring 7 people. Three more explosions occurred at 5:45 pm. Almost continuous explosions of the fireworks illuminated the sky all evening. The dense smoke caused by the fire could be

mitigated only two days later. Overall, this intervention involved 400 firefighters, police officers and military pyrotechnic specialists. In the hospital, 63 people were tested for smoke inhalation and hearing difficulties. A total of 450 homes, 11 businesses, fire trucks and police cars were injured due to missiles and shock waves in the 1km range. The damage caused to local property is estimated at 100 million.

The explosion of fireworks was surprising in the sense that they were all imported from China and classified only as 1.3 G (i.e. no danger of explosion) (Class 1 3: Substances and articles which are flammable and have a low risk of explosion but without the risk of explosion of the entire mass, such as materials that cause significant radiant heat, or which burn in succession with only a small explosion. Compatibility group G: A pyrotechnical article or article containing pyrotechnic articles or an object which also contains explosives and ignition, lightening, tearing or fogging agents (water-activated objects, white phosphorus, phosphides, pyrophoric material, flammable with the exception of articles containing liquids, gels or hypergles) [13] Danish authorities have decided to replace storage units containing pyrotechnic articles into rural areas. National legislation on the production and sale of fireworks has been revised to limit buyers' purchases and public consumption, and to limit the use of certain types of missiles by consumers. [14]

### **EXPLOSION AT A GUNPOWDER FACTORY NETHERLANDS, MUIDEN**

A gunpowder factory in a gun factory exploded at 8:35 am, killing 2 employees on the spot. The power of the explosion also caused the collapse of the opposing building used to cut the gunpowder bands. Workers in the collapsed building were found under the rubble and sustained very serious injuries. Many other local workers were injured due to falling objects and shattered glass.

Only craters remained where the building once stood. Many other factory buildings were also damaged and the glass windows damaged most of the buildings on the site. Many pipelines passing through the site have also been destroyed. In nearby towns, 350 homes and buildings were damaged and the total damage was estimated at 1 million Dutch guilders (the Dutch national currency used at the time of the accident). Firefighters, gendarmes, a number of elected army officials who discovered the ruins, road emergency personnel and local doctors came to the scene to help. The Gendarmerie, the Labor Inspectorate and the Dutch National Defense Agency conducted a joint investigation into the causes of the explosion. As a result of the joint work many theories have come to light. But one of these has been accepted that is most likely to contain the truth.

In Building 7, two dry dusty containers were replaced by 2 wet dust tanks. Either the container cover has not been properly earthed or the floor has not been swamped or washed with abundant water in advance, contradicting the procedural guidelines. The dust penetrated this cover, and an electrostatic charge that was accompanied by a spark could have caused the explosion to spread all over the tank, including those outside the building. [15]

### **SUMMARY**

In this article, I briefly described the current legal background of dangerous freight conventions and the major changes of the 2017 significant for military transport. All in all, it can be concluded that these changes include several important elements applying the Hungarian Army as well such as the new material identification number of missile engines, changes in the capacity of vehicles for the transport of explosives or the appearance of new written instructions. Analyzing the question of the exemption from military supplies, it can be stated that, using this option or being in compliance with ADR regulations both have advantages and disadvantages to be considered. On the one hand, the question arises as to

what threats unmarked cargoes pose to others on the road. On the other hand, compliance with these standards is not a negligible aspect given the cost of new equipment, vehicles and training. It is questionable whether the current vehicle fleet satisfies the requirements of ADR Part 9. It would be an optimal situation if the requirements of the ADR were based on the findings of military developments and experience, and the army would not have to follow civilian standards. This article does not attempt to answer this question, but merely states that it is not necessary for the Hungarian Army to prepare a new dangerous goods regulation, but instead – after considering the risks and costs – it would be helpful to build upon current ADR provisions for the preparation of respective internal instructions.

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