

Current issues of the transportation of dangerous goods by road, from the aspect of disaster management, with special emphasis to the accession of Hungary to the European Union

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Road transportation of dangerous goods is one of the greatest risks to the environment and of disasters. Domestic and international regulations were implemented to provide safety in this issue. However, the amount of dangerous materials to be transported, the frequency of the transports and the present state of the road network in Hungary together still mean a great potential hazard. Some of the authorities and experts think that we need additional rules and modes of management and checking concerning road transportation of dangerous goods. Authors of this article decided to provide some tools and help to achieve this.

Introduction

In recent years several publications – including one of the authors of the present article – have dealt with the situation of the general and some special fields of disaster management and the problems of legislation in force, of the organizational and personal conditions and of operation. Primarily on the basis of studying current literature and our personal experiences we make comprehensive recommendations and proposals related to the subject matter.

In this presentation we have chosen a special professional field. The reasons for this are that the transportation of dangerous goods by road carries an immense potential danger and we wish to present a picture of the situation for the sake of a more efficient prevention, on one hand. On the other hand, we wish to point out, in the interest of the necessary legislation harmonization with the relevant statutory provisions of the European Union, urgent measures that should be taken and issues that need a more strict regulation, arising from the transit character of our country.

Received: April 20, 2004

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Chemical industry has been hit by the economic difficulties of recent decade to a smaller degree than the national economy's average so this branch of industry – which can be regarded as developed at domestic as well as international level – is characterized by a significant increase. The further processing or distribution of goods produced here reaches the next actor of the consumer chain through transportation. Arising out of the conditions of our country this takes place through transportation either by rail or by road. However, in the increase of efficiency required by the economic sphere, the actors of transportation attribute such a great importance to mobility that transportation by road enjoys priority, despite its greater cost demand, as against transportation by rail. This cannot be considered domestic characteristics, since this transportation attitude can be confirmed also by the statistics in international transportation.

The international trade of goods, the Eastern–Western exchange of commodities, constitutes the other significant part of the transportation of the products of chemical industry. Resulted from the character of our country as transit country – taking the lag of the pace of the development of public roads as against the enlargement of transportations into consideration – this entails a great burden on our public roads. It should be considered that there is a great difference between the two geographical regions not only as regards economic development but also in the field of legislation and environment culture. It induces not only the normal possibilities of trade but also the utilization of benefits arising from other differences. The latter may have a huge role in respect of materials, which can be classified hazardous.

Risks of transportation

The transportation of hazardous materials by road constitutes a serious potential – or occasionally real – danger for the environment. Transportation vehicles are safe in general; meet the regulations (1), however, the possibility of occasional public road accident cannot be excluded. During transportation by road the possibility of the occurrence of emergency situation is great, also under the condition of adherence to the provisions of ADR. The possibility of the escalation of events depends, to a great extent, on the characteristics of the hazardous materials transported, the means of transport, the scene of the event and the preparedness of the driver as well as the professional skills and assets necessary for intervention.

While the quantity of domestic hydrocarbon exploitation will probably decrease, to a small extent, also in the next years to come, the production volume of chemical industry is continuously increasing. The transportation of hazardous materials by road

increases, to an extraordinary extent, within the country and from abroad, as well as in the form of transit.

Taking the transportation of hazardous waste also into consideration, the loading of public roads with hazardous materials increases to an extraordinary degree.

The safety of public roads deteriorates, because of the over-burdening with hazardous materials and the increasing car and other transportation traffic, to a great extent.

There is an increasing interest in the professional transportation of hazardous goods on the part of enterprises in an ever-growing number, since one of the possibilities to remain on the market is, for different freighter companies, to undertake to transport also hazardous materials among goods to be transported under special conditions. It is a strategic question whether somebody undertakes to convey hazardous materials or not. Namely one should be prepared for this thoroughly because it has technical and personal requirements, it needs special expertise and has great risks including financial one. Manufacturers, packers, forwarders, freighters, traders, distributors, etc. should deal with this matter thoroughly.

Goods transported most frequently

Vehicles transporting hazardous materials use almost all roads of the country and occasional accidents potentially threaten our environment.

For example:

- a) during re-filling of the containers of fuel stations with gas, fuel and diesel oil,
- b) during the supply with propane-butane of the households' gas container facilities and deployed containers of small consumers,
- c) during the distribution of oxygen and diluted acetylene bottles, which are used for activities allowed to be performed also in residential areas, therefore they can be found in a wide circle in the workshops of the different small and micro enterprises.

According to the estimation of the Institute of Traffic Science and also to German statistics, these types of hazardous materials form about 76–85% of the transported goods.

Regulations concerning the transportation of dangerous goods

In the event of accident, the effect on the environment of some of the goods offered for transportation is much greater than acceptable without any distinction. So they require

increased care and handling prior to and during transportation. For their distinction and management agreements depending on the traffic branches, to be applied also in international practice, were concluded. In transportation by public road this means the well-known ADR regulation. In the EU practice the use of the regularly updated ADR is regarded as appropriate in order to reach and fulfil the required safety. We wish to point out repeatedly the environment culture of the EU countries, which we will, later in our presentation, justify the grounds for stricter requirements of the Hungarian practice as against the Union's practice.

In EU legislation:

ADR Framework Directive

Directive 94/55/EEC, amended by: 96/86 – 2000/61 and 2001/7/EEC: Approximation of the laws of the Member States with regard to the transportation of dangerous goods by road

RID Framework Directive

Directive 96/49/EEC, amended by: 96/87 – 1999/48 – 2000/62 – 2001/6/EEC: Approximation of the laws of the Member States with regard to the transportation of dangerous goods by rail

ADN Framework Directive – Draft (!)

Checking Directive

Directive 95/50/EEC: on uniform procedures for checks on the transport of dangerous goods by road

Safety Advisers Directive

Directive 96/35/EEC: on the appointment and vocational qualification of safety advisers for the transport of dangerous goods by road, rail and inland waterway

Examination Requirements Directive

Directive 2000/18/EEC: on minimum examination requirements of safety advisers for the transport of dangerous goods by road, rail and inland waterway

Minimum Requirements for Vessels Directive

Directive 93/75/EEC concerning minimum requirements for vessels bound for or leaving Community ports and carrying dangerous or polluting goods

Type Approval Directive

Directive 98/91/EEC relating to the type approval of motor vehicles and their trailers intended for the transport of dangerous goods by road

UN Recommendations-based international regulations relating to different traffic sub-branches and their appearance in domestic legislation:

Air traffic:

- The ICAO Technical Instruction is the Annex 18. of the so-called Chicago Convention. In the present Hungarian legislation the following must be underlined: Statutory Rule No. 25. of 1971, the Decree of the Minister of Traffic, Communications and Water Management (KHVM, the Hungarian abbreviation) No. 20/1997. (X.21.) and the Government Decree No. 26/1999. (II.12.).

Sea traffic:

- IMDG-Code is a recommendation and must be applied through the Safety of Life at Sea International Convention (SOLAS). SOLAS was promulgated in Hungary by the Decree of the Council of Ministers No. 16/1980. (V.23.). This was replaced by the Statutory Rules X. and XI. of 2001, together with the promulgation of the MARPOL Convention.

Rail traffic:

- The RID is at present Annex 1. to Appendix B of CITIF. In the present Hungarian legislation the following must be underlined: Statutory Rule 2. of 1986, the Decree of the Minister of Traffic (KM, the Hungarian abbreviation) No. 4/1987. (V.13.) and the Decree of the Minister of Traffic, Communications and Construction (KöHÉM, the Hungarian abbreviation) No. 12./1990. (IV.30.). The Decree of the KöHÉM was amended six times to date; the last is the Decree of the KHVM No. 17/1999. (VI.9.).

Inland waterway traffic:

- Hungary promulgated the ADN by the Decree of the Minister of Traffic and Postal Affairs (KpM) No. 2/1982k. (II.22.) which was amended twice since then.

Road traffic:

- The ADR Convention regulates the international transportation of dangerous goods by road. In the present Hungarian legislation the following must be underlined: the Statutory Rule No. 19. of 1979 and the Decree of the KpM No. 20/1979 (IX.18.). The Decree of the KpM No. 20/1979 (IX.18.) was amended eight times since then, the last one is the Decree of the KHVM No. 18/1999. (VI.9.).

The stricter regulatory system of Hungary

In the case of the transportation of some materials – contained also in ADR – the Hungarian practice did not find the use of the international regulation enough and decided, on the basis of ADR, however, on the application of a stricter regulation than that. The core of the stricter regulation is that in the case of some materials, over a

defined threshold quantity, transportation cannot take place in a route chosen arbitrary but only in a route defined and designated by the authority. The practice of the Union applies only the ADR regulation.

During designation of a route the following main aspects to be considered:

- a) between the point of departure and arrival of the delivery the shortest possible route should be designated which is the safest from the aspect of traffic.
- b) From among routes providing for similar safety a route with smaller traffic should be designated which would threaten, in the event of occasional escape of hazardous material, the safety of life and property and the natural and built environment to the less extent.
- c) The route to be designated should adapt to the route of the Engineering Bases – possibly along the whole line.
- d) More vehicles transporting dangerous goods should not possibly travel on similar route simultaneously.

Possible method of satellite surveillance of the transportation of dangerous goods

During our accession to the European Union our country will be a border Member State of the Community. This will, in the sense of the Schengen Agreement, mean further difficulties in the control of the transborder – here already should be understood the border of the European Union – transportation of hazardous materials. More examples prove that the western countries – exploiting the deficiencies of legislation and environment culture of regions lying to the east from them – regard these countries as target countries from the aspect of hazardous waste disposal. Unfortunately our country is not an exception of this, either. In the interest of the implementation of transit deliveries and in the case of transportations which can be considered especially dangerous and a route must be designated for them, as defined by statutory provision, establishing a stricter surveillance and control seems to be practical. The use of the satellite tracing system can be a very simple and safe method of this, after the establishment of the above mentioned system.

The *GPS based tracing system* – as it is called shortly – can, in addition to assist in the avoidance of disaster threat, make damage liquidation easier to a significant extent (3.). On one hand, continued tracing can ensure the moving of the transporting vehicle on the designated route and, on the other hand, the system, which can be equipped with discretionary parameters, can assist, in the event of the occurrence of accident, in the most efficient way the rescue work of the initial damage eliminators through the delivery of immediate and accurate data. The introduction of the GPS system can be

reasonable independent from the circumstances that we do not find any example in the Union's practice at present for use in the interest of the authority and the damage eliminators.

Description of the planned system

The system to be established comprises two sub-systems:

- a) vehicle tracing and operational centres
- b) satellite vehicle tracing units.

The set of equipment structured in this way will be capable to forward position data obtained from the mobile unit, to display and evaluate them and, on the basis of this, to support the taking of appropriate measures.

Every transportation route and procedure which takes place on the ground can be integrated in the system. The tracing unit which can be installed on the vehicle can be complemented, beyond the positioning GPS instrument, by a chemical or radiological detector, depending on the type of the consignment, which, in the event of any damage to the consignment, will alert automatically the driver and the centre.

The basic software interprets the incoming data and displays them, after transformation, in the map-displaying window as the position of the vehicle on the map. In normal mode, the mark of the position of the vehicle should fall on the route defined in the route (line) permit in advance, exactly on the section of the route defined in the schedule plan. In any other case the system generates alarm. In the event of alarm the incoming signal calls the attention of the operator to the event. The text displayed describes information belonging to the vehicle chosen.

The database includes the following data:

- a) position arising from the line permit, current position, direction and speed,
- b) quality, quantity, parameters and changes of parameters of the delivered material.

The above system was presented already at the conference on disaster protection and industrial safety organized by the Regional Coordination Centre for Industrial Accident Prevention of the UN European Economic Commission in the previous years.

Prevention of illegal traffic

The illegal traffic of nuclear materials is, according to domestic and Western European experiences, at present not considerable, however, for security reasons, great emphasis

should be placed on the repression of such phenomena and the development of the essential protection.

According to international experiences the majority of the problems arises from scrap-metal consignments which often emit ionising radiation higher than allowed.

In the detection of the illegal traffic of radiating and/or radioactive material the customs service plays a key role which, during the control of goods and passenger traffic, can filter out such activity at the state borders first (4.). One possibility of control may be the operation radiation control gates deployed at the Schengen border crossing stations established newly which is at present already an accepted practice on the Austrian side.

Issues of checking

One of the issues of checking is that in Hungary the number of places established for the control of axial pressure or which can be used for this purpose is about 460. This number seems to be relatively high, however, if we examine the question from the aspect of traffic technology, it can be stated, that the number mentioned should be narrowed down significantly for the checking of dangerous goods and a traffic technology system should be established which excludes the increase of the threat of accident. Furthermore, a basic requirement of checking is training of the professional personnel which will be able to perform control quickly and in consideration of the details of regulations. Such personnel are available or can be made available primarily at the Traffic Inspectorates. The question is, however, whether the continuation or development of this procedure is reasonable when, as a consequence of our accession to the European Union will develop a new situation also in this regard. Namely, the European Union developed its Directive 95/50/EEC on the checks on the transport of dangerous goods by road and also the Directive 96/35/EEC which prescribes the obligatory appointment of safety advisers for the transport of dangerous goods.

Consequently, in such a way, through the appointment of safety adviser – who is alone responsible for complying with the rules in this regard – checking at the place of departure and reception will be realized. Beyond this, it regulates checking en route in such a way that it must be representative, random, should extend to a great part of the road network and make it possible to take sample and stop irregularity.

In our opinion, – since in the case of the transportation of dangerous goods, time, in itself, constitutes a threat or risk factor – we find it allowable only in very exceptional case to extend it through en route checking.

Checking should be made primarily at the loading place or at the place of arrival to the border crossing point. En route attention should be paid most of all to the compliance with the prescribed line and the rules of the Traffic Code.

In order to meet these requirements we should also change over – sooner or later – from the present specialised checking to complex checking which is becoming more and more general in the EU Member States. During this, checking by the competent authority or authorities extends to technical, environmental, axle load and total mass checking and in some cases also to drug search.

Taking all this into consideration, the elaboration of technical and personal conditions associated with the establishment of this complex checking system should be dealt with already now through the urgent issuing of adequate directives, since from the 1st of May 2004 also the EU experts will pay special attention to domestic regulations and the application of regulation so the time for preparation for this is very short. That is why we urge, at least, on the issuing of the mentioned directives as soon as possible in order to prepare the forwarders adequately.

The final conclusion of our present study is that the transportation of dangerous goods by road constitutes a serious problem throughout the world for the population and the organs participating in the elimination of occasional accidents. It is well known that one of the most dangerous operation in the world where most accidents occur and most people die is transportation by road.

In Hungary the number of accidents occurred during transportation of dangerous goods shows an increasing trend. In order to prevent accidents and to eliminate their consequences efficient and quick measures should be taken since the requirements of the accession of Hungary to the European Union includes the organization of a stable, well-ordered and checked transportation of dangerous materials and conduct of the transit traffic of dangerous goods.

It means an extraordinary great task to introduce, after our accession to the EU, the strictest ADR checking at our borders with non-EU Member States, because, in the event of any irregularity in connection with consignments entered, responsibility will definitely fall on us, as entering country. In order to meet requirements, we should, sooner or later, *change over from the present specialised checking to complex checking becoming more and more general in the EU Member States*. For this, we hold necessary to establish well-coordinated cooperation among the different professional authorities (Border Guard, Customs and Finance Guard, environment authority, Traffic Inspectorate, disaster management administration, etc.).

References

1. Decree of the Government No. 1/2002. (I. 11.) on uniform procedure on the checking of transportation of dangerous goods by road
2. Decree of the Minister of Traffic and Postal Affairs (KPM) No. 20/1979. (IX. 18.) on the promulgation and domestic application of Annexes "A" and "B" to the European Agreement on the International Transportation of Dangerous Goods by Road
3. K. NAGY, L. NAGY, L. FÖLDI: Transportation of dangerous goods by road, *Hírlevél*, VIII. 9 (2000) 13.
4. Decree of the Council of Ministers No. 122/1989. (XII .5.) on the designation of the route of vehicles transporting dangerous goods by road