

## **MEASURES TO GUIDE TRAFFIC OF DANGEROUS GOODS TRANSPORTS IN THE FEDERAL REPUBLIC OF GERMANY**

**Hans-Günter Triebel**

*Ministry for Town Planning, Housing and Transport in  
Nordrhein-Westfalen, Breite Strasse 31, D-4000 Düsseldorf, Germany*

### **SUMMARY**

In this paper measures to guide traffic of dangerous goods transports in the Federal Republic of Germany will be discussed. In this respect the following measures are relevant:

- restriction of the free choice of means of transportation for freight which is highly dangerous;
- problems with combined transport with dangerous freight;
- definition of travel lanes for the transport of highly dangerous freight;
- closure of certain roads to motor lorries with compulsory designation carrying dangerous goods;
- accident preventing encapsulation of dangerous goods instead of measures to control traffic.

### **1. INTRODUCTION**

From the point of view of warding off danger the transportation of dangerous goods on all carriers is subject to special regulations. These legal standards, equally valid for national and international transports, define which goods are permitted to be conveyed, which encapsulation must be used, how these must be labelled, which documents must accompany the shipments, if and how drivers must be trained and much more. Therefore, it may be assumed that this ensures compliance with these regulations in respect of the dangers involved in the transportation of dangerous goods. However, doubts, whether adequate legal standards to ward off danger are included in the specific laws and regulations, which are translated from international treaties, with regard to the conveyance of dangerous goods, arise when we consider that in the Federal Republic of Germany additional, specific regulations for dangerous goods and the general highway code are used for the transportation of dangerous goods.

### **2. CHOICE OF MEANS OF TRANSPORTATION**

The free choice of means of transport for some so-called highly dangerous goods has been restricted in the Federal Republic by the regulation governing the inter-state and border-crossing road transportation of dangerous goods (GGVS) – superseding international regulations – in such a way that these dangerous goods, which in principle are allowed on the roads, may only be transported by road in part or in whole subject to certain

conditions. The corresponding rules of this German regulation provide a preference for direct rail and inland shipping traffic and for combined traffic 'rail/road' and 'inland shipping/road'. The paragraphs 7, 7 a GGVS allowing the transportation of dangerous goods by road only, when certificates from German Rail and from the Directorate for Inland Shipping are submitted stating that a rail-connection, container transport or pickaback transport are not possible. This concerns goods on the so-called list I, which comprises among other things a series of explosives, articles containing explosives, gases, and poisonous and corroding substances. Furthermore this negative certificate is for container transport required only, if the distance in the Federal Republic exceeds 200 km and the container can be transported over the larger part of that distance by rail or barge. The same applies to pickaback transports in respect of distances exceeding 400 km. These regulations apply to border-crossing traffic as well. Whenever the forwarder opts for combined transportation of containers by rail/road or road/inland shipping, or if he uses pickaback transport, then this must be recorded on the bill of lading for the conveyance to or from the nearest railway station or port.

### 3. COMBINED TRANSPORT

The fact that highly dangerous goods are referred to combined transport of containers or of pickaback transport over distances exceeding 200 km or 400 km respectively has as a consequence that transports of dangerous goods to and from railway or inland shipping terminals can also be expected in the streets of towns, where they would not appear if they were carried exclusively by road. The reason is that first of all many transfer railway stations are located in the town centres. The maker of the regulation was well aware of this situation, that is of the increase in dangerous goods transportation in the town centres. If he has after all decided to choose for the compulsory use of combined transport, then he did so, because in weighing up the dangers he preferred the shorter distances by road together with the transfer, especially transfer to the railways. Due to the sharply increased road traffic dangerous loads carried by lorries are constantly in the vicinity of people, also on roads outside the built-up areas. Since the risks of accidents on the road increases with the lengths of the distances covered, it seemed justified to further reduce the risks of road accidents involving dangerous goods by minimizing the utilization of roads to part of the total transport distance.

### 4. DEFINITION OF TRAVEL LANES

For the transportation of goods mentioned in list I and a few other dangerous substances, included in the so-called list II, only those roads may be used which have been officially defined, or whose use has not been banned. Here the following principles, laid down by law, apply:

- The dangerous goods included in the lists I and II are to be forwarded by motorway.
- The transporter is exempted from using the motorway, if such use is impermissible. According to the GGVS this is in particular

the case, if the travel distance is at least twice as long as it would be if other suitable roads were used.

- The route on roads other than motorways is confirmed in writing by the competent traffic authority for one single trip or for a limited or unlimited number of trips within a specified period not exceeding three years. This may also be done by a so-called general order, which may be made public.

The designation of routes other than motorways must be applied for by transporters, forwarders, shippers or consignees with the competent authority. The transporter may only carry the goods after a route designation has been granted. He has to see to it that the document regarding the route designation is handed to the driver before transportation commences. The driver has to carry this document with him throughout the trip.

The risks which are involved in the road transport of dangerous goods and which consist of the possibility of dangerous matter being accidentally released, endangering people's life and health and the environment, are limited in the Federal Republic by regulations contained in the Traffic Ordinance (StVO) as well. For instance, paragraph 3 section 3a of the StVO determines that drivers of motor lorries with compulsory designation must behave in such a manner that any danger to others is impossible, if due to fog, snow or rain visibility is less than 50 m. The same applies to slippery road conditions on account of snow or glazed frost.

## 5. CLOSURE OF ROADS

Furthermore the routes of dangerous goods transports are also designated by means of road closures indicated by two traffic signs. These traffic signs are the sign no. 261, a round white sign with a red border, showing the back view of an orange-coloured motor lorry, and sign no. 269, also a round white sign with a red border, but showing the back view of tanker with an orange tank over a wavy, blue double line. The first sign indicates a ban for lorries with compulsory designation carrying dangerous goods, also for such motor lorries, including trailers, which must be distinguished by orange-coloured warning signs, the second sign indicates the ban for vehicles carrying a load which may be dangerous to water. Since the tragic accident involving a tanker in Herborn in July 1987 these signs have been put up in the Federal Republic at an increased rate. Criteria for the erection of these signs are contained in the administrative provision of the Traffic Ordinance and in the directives of the Federal Minister for Transport ordering measures for the control of traffic involving road transport of dangerous goods. Besides, the signs are to be put up if there is reason to fear that owing to an accident or incident, or to leakage of a tank, the dangerous goods may pose a serious danger to life, health, the environment or buildings. This will be the case on a fairly long, i.e. at least 500 m long, gradient - with steeper gradients even shorter sections - with an average gradient of more than 4%, which is situated in the immediate vicinity of a built-up area or runs through a settlement or through a business area or an industrial area.

When the passage through a town or village involves the negotiation of narrow and/or winding streets where it is not

possible to pass oncoming traffic, especially lorries, without actually reducing speed or coming to a standstill at narrow spots the sign 261 must also be put up. Where a public road crosses the catchment area of a ground water or spring preservation area (a so-called ground-water preservation zone I) the erection of the sign 269 must be ordered.

In Nordrhein-Westfalen, the most densely populated area in the Federal Republic, over 125 gradients have been closed to dangerous goods transports by traffic signs. Thereby the authorities cannot restrict themselves to the closing of certain road sections. Simultaneously relief routes must be defined in order to avoid dangerous situations at other locations. Moreover it is essential to announce the closing and the diversion in time by means of special traffic signs.

Should there not be any suitable diversion routes, then other traffic control measures, to ensure safety at the location where a dangerous situation exists, must be taken. To this end road signs with a warning about especially dangerous road sections (gradients, narrow passages, water preservation areas) can be considered, but more appropriately, a reduction of the speed limits should be considered first of all.

In road tunnels there are, according to the directive of the Federal Transport Minister, as a rule no additional dangers in connection with the transport of dangerous goods. Here the fire prevention, however, insists on certain traffic restrictions, in particular a ban on transports of explosives or inflammable substances through tunnels. In the risk analysis it is examined whether the potential danger of underground transportation of dangerous goods is justifiable and which structural and traffic regulatory measures must be taken.

As is the case with all rules based on legal regulations, their purpose is only served if they are observed. The traffic control measures are first of all directed at the driver. It actually depends on his attitude whether the goal the standards aim at, is reached. Moreover traffic control measures are not effective, if, due to technical defects in the vehicle or mistakes in the operation of the equipment or instruments the lorry with its dangerous load finds itself on a road which the driver should not use and did not even intend to take in the first place.

## 6. ENCAPSULATION OF DANGEROUS GOODS

The legal and official measures presented so far are necessary, because the encapsulation of dangerous freight, be it packaging or containers or tanks are not in every respect absolutely accident-proof, even in conjunction with additional measures for maintenance and stowage or - in the case of tanks - with anti-collision barriers on the sides and at the back. All in all, the encapsulation is not accident-proof as is demonstrated by a large number of accidents. It may be that the traffic control measures to reduce the danger inherent in the transport of dangerous goods are suitable and desirable, and also acceptable and therefore appropriate to the people concerned. All the same one may wonder why no adequate measures are taken specifically with regard to the encapsulation of dangerous goods in order to render their transport safer.

The question whether it is possible to increase the resistibility and so the safety of the encapsulation permitted today can be answered affirmatively for the simple reason that test requirements for encapsulation, as shown in the various regulations can be tightened. Even the most stringent test requirements can be tightened further. What also may be considered is to leave the test requirements as they stand and supplement them with additional safety precautions, such as containerisation of packed dangerous goods or the banning of any reductions in the thickness of tank walls, which at present can be allowed under certain conditions.

Once the test requirements are tightened or additional safety precautions are taken, naturally the prices for the manufacture of encapsulation materials or the additional cost of safety precautions will go up, the transport rates will rise because of the higher tare and dangerous goods can no longer be supplied under the present price conditions. But should not this price increase be accepted as a cheap price to pay for the protection of the environment? It may be argued that the total cost of compensating damages in connection with the transport of dangerous goods is less than the cost involved in manufacturing and utilising accident-proof encapsulation coupled with additional safety precautions. Whoever introduces this argument to block greater safety in the transportation of dangerous goods, should, indeed, be prepared to face the counter-argument that he accepts the unjustifiable, partial risk of people dying and having their health impaired due to accidents involving the transportation of dangerous substances. Damage to the environment resulting from traffic accidents involving dangerous goods, may be expressed in terms of money, on the basis of liability under civil law, but as a rule restoration of the natural environment is very much restricted within narrow bounds, because the restoration of the situation, as it existed before the damage was done, is just not possible. Often irreparable damage, handed down from generation to generation, stays with us.

Safe encapsulation for dangerous goods can initially only be prescribed as an ideal in the form of legal regulations. It would seem easier to enforce this regulatory target, since the regulations are not directed, as is normally the case in respect of traffic control rules, against only one person, namely the driver. When, however, several persons are made responsible, such as the manufacturer of the encapsulation, the packer or filler, the owner of the goods at the transfer point, the transporter and the driver, then the risk of an offence being committed will be smaller. What remains is the necessity of an international agreement on the formulation of a set of technical regulations regarding the transport of dangerous goods, which will ensure that in future the transportation of dangerous goods does not present any greater danger than the transportation of harmless goods.