

Consideration for draft amendments to Regulation 34 (Prevention of fire risks)

Note: The text reproduced below was prepared by the experts from the Netherlands in order to improve the prevention against fire risks caused by leakage of fuel after an impact.

Introduction

Tank-vehicle fires

The following information is derived from a study conducted by the Dutch Safety Board (DSB). A thematic study on 'Tank Lorry Fires involving Dangerous goods'*/ was launched in response to two major tank-vehicle fires (in 2001 and 2003). In the course of the investigation another major tank-vehicle fire took place. In all three cases, the tank-vehicles carried flammable substances (fuel, ethyl acetate and a LPG mixture with isobutene) and were involved in a road accident. One notable similarity was that in each of these cases the fuel tanks under the vehicles were damaged due to the accident and leaked large quantities of diesel which caught fire. As a result the motorway had to be closed off for hours and the evacuation of the surrounding area caused considerable disruption and economic damage.

Vulnerability of fuel tanks

In the study the vulnerability of fuel tanks has been identified as a specific risk factor. The Safety Board estimated, based on its investigation, that in the Netherlands every year some fifty to one hundred accidents take place in which the fuel tanks of the freight vehicles involved are damaged to such an extent that significant amounts of fuel leak out.

Possibilities and support for improvements

DSB concluded that there are in principle three ways in which the risk of leakage from the fuel tank in the event of an accident can be reduced:

- (a) changing the position of the fuel tank on the vehicle;
- (b) changing its construction;
- (c) provide better shielding.

Reducing the capacity of the fuel tanks or compartmentalising the tank could limit the consequence of leakages.

The fuel tanks of freight vehicles including tank-vehicles are in general located between the front and rear axles, on the outside of the chassis members. The available space in these area is increasingly limited by new developed equipments like those for exhaust gas treatment. Because of this limited space the fuel tanks are made wider and more to the outside of the side contours of the vehicle, which increases the vulnerability of the fuel tank(s).

Fuel tanks are made from thin steel plate or aluminium plate and are single-walled. The strength of the tanks is determined by the shape, material used and material thickness. The report recommends improvement in overall strength and of the resistance to penetration by foreign objects. Improvement can come from better construction, choice of materials and thickness and shape or from additional shielding.

Some vehicles are shielded already on the sides. The shields used are however made of plastic materials for aerodynamic and/or aesthetic reasons rather offering protection of the fuel tank(s).

In the case of vehicles used for long distances (internationally), the tank capacity is generally at least between seven and eight hundred litres. This segment is currently subject to a trend towards even larger tank capacities, increasing to almost 1,500 litres. This makes it possible to realise savings by purchasing fuel in places where it is cheapest.

Proposed procedure

There is already some discussion going on in different bodies or committees on the vulnerability of the fuel tanks and the way to do something about it (for instance in the BLEVE working group of the RID/ADR/ADN Joint Meeting). Besides the already mentioned possibilities for improvement the BLEVE working group also suggested the option of limiting the fuel capacity or having aluminium foils or balls in the fuel tank.

Preferably these alternatives should be adopted for all freight transport and not just the transport of dangerous goods. Therefore this topic has to be discussed in the GRSG, which deals with general safety features of vehicles. Should the developing discussion in GRSG make a specific dangerous goods approach necessary, this can then be addressed by WP.15.

*/ 'Tank Lorry Fires involving Dangerous goods':

http://www.safetyboard.nl/publications/dsb/study_tank_lorry_fires.pdf