

**Economic Commission for Europe
Inland Transport Committee
Working Party on the Transport of Dangerous Goods
102nd session**

INF.20

Geneva, 8-12 May 2017

10 May 2017

ECE/TRANS/WP.15/2017/8

**Increase of amount of explosives per
transport unit**

1.- KEY POINTS

a.- ¿what was analysed to make the proposal? (the reference)

Area of damages caused by an explosion of explosives -class 1- which is the **WORST** result of any type of safety risk during transportation (fire, crashes, rollovers, etc.).

b.- Way of measuring the area of damages

There are several formulas / tables that can be used to calculate the area of damages caused by an explosion of explosives -class 1-; may be one per country. But whatever we use the conclusions would be the same since all of them are based on the same type of equation

$$\mathbf{D = K \sqrt[3]{Q}}$$

The reason to use the ATF criteria was because it was established specifically for “explosion of vehicles” and therefore is more “visual”, but as it was aforesaid the conclusions using other formulas would be the same

ATF	VEHICLE DESCRIPTION	MAXIMUM EXPLOSIVES CAPACITY	LETHAL AIR BLAST RANGE	MINIMUM EVACUATION DISTANCE	FALLING GLASS HAZARD
	COMPACT SEDAN	500 Pounds 227 Kilos <i>(In Trunk)</i>	100 Feet 30 Meters	1,500 Feet 457 Meters	1,250 Feet 381 Meters
	FULL SIZE SEDAN	1,000 Pounds 455 Kilos <i>(In Trunk)</i>	125 Feet 38 Meters	1,750 Feet 534 Meters	1,750 Feet 534 Meters
	PASSENGER VAN OR CARGO VAN	4,000 Pounds 1,818 Kilos	200 Feet 61 Meters	2,750 Feet 838 Meters	2,750 Feet 838 Meters
	SMALL BOX VAN <i>(14 FT BOX)</i>	10,000 Pounds 4,545 Kilos	300 Feet 91 Meters	3,750 Feet 1,143 Meters	3,750 Feet 1,143 Meters
	BOX VAN OR WATER/FUEL TRUCK	30,000 Pounds 13,636 Kilos	450 Feet 137 Meters	6,500 Feet 1,982 Meters	6,500 Feet 1,982 Meters
	SEMI-TRAILER	60,000 Pounds 27,273 Kilos	600 Feet 183 Meters	7,000 Feet 2,134 Meters	7,000 Feet 2,134 Meters

Even though there are “safety distances” in the previous table and in the calculations included in the Annex I, it is important to emphasised that this distances are used only for the reasoning and calculations.

Nothing is established in the ADR about safety distances, not only for explosives, but also for other Dangerous Goods which have risk of explosion. Safety distances in an explosion depend on the land relief, natural defences like elevation of the terrain, trees among others. The safety distances are usually established by the emergency services in every particular case.

2.- APPROACH

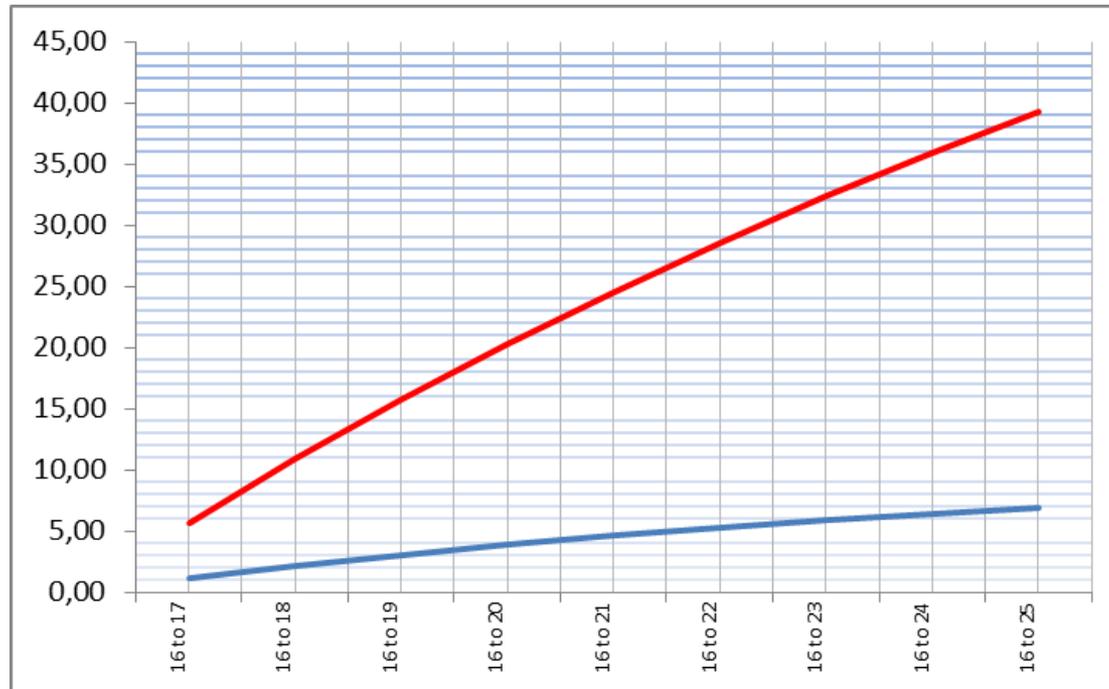
An increase in the quantities to be transported means (in a period of time):

- On the one hand, a reduction in the number of trips, and therefore a reduction in the same proportion, of the probability of having an accident (explosion, worst case)
- On the other hand an increase in the area of damages due to the fact that the amount is more.

3.- RESULTS (mix of both premises)

The result of the calculations when mixing both premises is the one shown in the curves of the figure 1 of the document.

As the amount of explosives class 1 increases, the area of damages is reduced



4.- WHY 20 tons?

Even though the initial idea in the INF 13 was limiting the quantities to the maximum authorised for the type of truck itself, some comments were received saying that it would be convenient to go ahead “step by step”.

Nevertheless the conclusion remains the same, that is to say, *MORE quantities LESS damages caused by an explosion for a period of time*

Note: It is not too late yet to come back to the initial proposal in INF 13 (no limits)

4.- WHY that UN numbers? (0027, 0081, 0082, 0083, 0084, 0241, 0331, 0332)

Class 1 is very diverse; It includes –apart from blasting explosives- pyrotechnics, military devices and articles etc., which have a different behaviour and probably different effects in terms of affected area; for that reason the proposal was review (with respect to INF 13) to limit the increase of quantities only for “**blasting explosives and black powder**”, which are the ones usually used in mining and civil works activities and more transported around Europe.

5.- Other considerations

The proposal to increase the quantities would have other benefits in terms of safety, security, environment and competitiveness.

1. Even though the reasoning of the document is based uniquely on the “worst case” (explosion) there also would be a reduction in the number of accidents / incidents without the result of an explosion. This would benefit the “society in general” since when there is any type of accident / incident some “extreme measures” are adopted immediately, such roadblocks, evacuation of people in the area around etc. The disruptions and costs of such measures are quite important, for sure.

2. In terms of Security, there is a common principle and saying in Spain by the Security Forces: *The explosives must be out of the magazines the shortest possible time.* The reduction in the number of trips would benefit this premise

3. In terms of maritime transportation it is not possible for the European Industry to ship containers with more than 16 tons since they have to be transported by road previously. This limitation does not exist in any other country or economic space around the world..

5.- Other considerations (2)

4. In terms of “Greenhouse Gas Emissions” the reduction in the number of trips would have also a significant impact.
5. The deterioration of roads and motor ways is an additional aspect to take into account.
6. Only limits in the ADR for organic peroxides (class 5.2) and self-reactive substances (class 4.1) -20 tons-. This quantity was considerably increased in 2007
7. No limits in other modal regulations (RID, IMO etc.)

THANK YOU VERY MUCH