

Economic Commission for Europe

Inland Transport Committee

Working Party on the Transport of Dangerous Goods

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Item 5 (a) of the provisional agenda

**Proposals for amendments to annexes A and B of ADR:
construction and approval of vehicles**

Stability of tank vehicles – ADR 9.7.5.1 and 9.7.5.2

Transmitted by the European Chemical Industry Council (CEFIC)

Summary

Executive summary: Concerns regarding the stability requirements in ADR 9.7.5.1 and 9.7.5.2 have been risen.

Action to be taken: Discuss ADR 9.7.5.1 and 9.7.5.2 further in a working group.

Introduction

Concerns has been risen in the industry on how ADR defines the requirement for a bulk liquid road tanker's maximum allowable centre of gravity (CoG).

1. ADR 9.7.5.1 states

“The overall width of the ground-bearing surface (distance between the outer points of contact with the ground of the right hand tyre and the left hand tyre of the same axle) shall be at least equal to 90% of the height of the centre of gravity of the laden tank vehicle...”

As the distance between the outer points of contact with the ground of the right hand tyre and the left hand tyre of the same axle is approximately 2.5m this would allow a tanker to have a centre of gravity $CoG = 2.5/0.9 = 2.777$ m.

Noting that the lower the tanker's CoG the better its stability, we believe it was not the intent of ADR to allow road tankers to operate with a CoG up to 2.777 m.

Whilst this might not be a real safety issue in Europe, where stability of tankers is assured, this can be the case in developing countries who look to the European ADR for guidance.

In fact, ADR is adopted in several countries, where there is a higher probability that the carrier applies the rule to the limit: hence because the Petrochemical and Gas industry operates in those markets, we should make sure that the European regulation is correct, also in that respect.

2. ADR 9.7.5.2 states

In addition, tank-vehicles with fixed tanks with a capacity of more than 3 m³ intended for the carriage of dangerous goods in the liquid or molten state tested with a pressure of less than 4 bar, shall comply with the technical requirements of UN Regulation No. 111 for lateral stability, as amended, in accordance with the dates of application specified therein. The requirements are applicable to tank-vehicles which are first registered as from 1 July 2003.

In fact, this directive brings even more ambiguity in the subject:

- It is not clear what the rationale is of having ADR 9.7.5.1, when UN Regulation No. 111 specifically applies to ADR vehicles (for example see UN Regulation No. 111 Chapter 1);
- ADR prescribes the application of UN Regulation No. 111 to tank vehicles with a test pressure < 4 bar, something that is not mentioned in UN Regulation No. 111 itself;
- On the other hand, the rollover of tank vehicles with non-dangerous goods liquids or semi-trailers of tank containers is not covered by ADR not by UN Regulation No. 111 but it does lead to similar risks;
- It looks like in the two approaches (ADR and UN Regulation No. 111) that different criteria are used;
- ADR 9.7.5.1 (so applicable tank cars with the riskier substances, and with test pressure ≥ 4 bar) looks simply at the center of gravity and basic plane;
- For the majority of tank vehicles (including for gasoline etc.), UN Regulation No. 111 needs a complex calculation that contains many more variables (such as the suspension) and verifies that no rollover can occur with a lateral acceleration (UN Regulation No. 111, paragraph 5.3.1.2) of 4 m/s^2 or with an inclination angle of 23 degrees (5.3.1.1);
- The ECE Standard considers filling grades between 70% and 100% of single compartment trucks, whilst ADR prohibits fillings between 20% and 80% and considers partitions and surge plates.

All this is a bit confusing and not aligned within ADR. In any case it'd be good to notice that applying ADR outside of Europe means also applying this directive, which is more stringent than the simple statement in 9.7.5.1 for trucks of low-test pressures.

Proposals

We propose to convene an informal working group to discuss it further. Our suggested options are to correct the 9.7.5.1 or to remove it and reference compliance to UN Regulation No. 111.

Justification

The stability requirement for truck indicated in ADR is probably incorrect.

Since ADR is used in many developing countries as a guidance, incorrect references can lead to dangerous situations.
