

Economic Commission for Europe
Inland Transport Committee
Working Party on the Transport of Dangerous Goods
Joint Meeting of the RID Committee of Experts and the
Working Party on the Transport of Dangerous Goods
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Item 5(b) of the provisional agenda
Interpretation of RID/ADR/ADN

15 March 2012

Premature activation of safety valves in the carriage of refrigerated liquefied gases in RID/ADR tanks; taking over the provisions for portable tanks with respect to holding times and reference holding times for RID/ADR tanks

Transmitted by the European Industrial Gases Association (EIGA)

Introduction

1. EIGA welcomes the work carried out by UIC and submitted to the Joint Meeting in document ECE/TRANS/WP. 15/AC.1/2012/1. EIGA submits this paper to consider some of the issues and clarify some of the points raised by UIC.

Discussion

2. The first point to consider is that the operation of the safety valves on a tank is not a safety issue as they are designed to operate to reduce the pressure in the tank.
3. In respect to the proposal submitted by the UIC firstly considering tank vehicles.
4. Typically a tank vehicle will make a number of deliveries to different customers during an operating shift. It may also be filled from a number of different sites, and be operated 24 hours a day.

Where a tank vehicle, by road, differs from a rail tank wagon or a portable tank (during sea transport) is that it is accompanied by a qualified driver, who has been trained on the operation of the tank vehicle as well as the product it contains. The driver can take the appropriate action to control the pressure prior to travelling or in the event a safety valve operating, i.e. to reduce the pressure.

5. There are also other issues to consider:

The filling of the tank vehicle may be carried out automatically with only the driver in attendance.

- This would mean that the holding time would have to be calculated by the driver for each journey and marked on the tank vehicle, as he is the only person who is present.

To carry out the calculation, the driver would require certain information concerning the properties of the liquid, which may not be readably available at the filling site.

- To achieve this, all filling sites would have to provide a common system to present the information in a format the driver could use and understand.

- The driver would then have to complete the calculation and mark the plate.
- The plate would require not only the holding time but also an indication of the date and time as there may be a number of different journeys in any one day.
- We can not expect drivers to be responsible or accountable to carry out calculations of this type.

6. Therefore for the above reasons EIGA considers the proposal by UIC to be an unnecessary requirement for ADR.

7. In respect of the proposal submitted by the UIC considering tank wagons:

EIGA understands the disruption that can be caused by the operation of safety valves during a rail journey.

The issue with rail cars is different to that of road tanks, as they do not have a driver with the tank at all times that could take any necessary measures to control the pressure.

One EIGA member company has carried out work on the reasons why safety valves operate during rail transport; this has resulted in a reduction of instances of safety valve operation from five per year to less than one per year.

This work came to the conclusion that the two most important points in preventing premature operation of the safety valves were:

- Ensure that the tank was cooled down correctly so when it is filled with liquid it did not generate flash gas raising the pressure.
- The tank pressure was reduced prior to transport, i.e. the vessel is blown down before travelling.

Being unaccompanied during transport is where rail transport differs from that by road. If a rail car is cooled down correctly and blown down prior to travelling then the holding time (what ever it is) now depends on a number of different factors outside the control of the filler at the time of filling.

Environmental:

- the outside air temperature, amount of sunlight, where the rail car is parked, in the sun or shade.

Mechanical:

- condition of the paintwork, and the efficiency of the insulation system.

NOTE: The value used for the insulation system is based on that provided by the manufacturer when the tank wagon is new.

Procedural:

- delays prior to transport being held in a siding, for a number of days before shipping, without the pressure being lowered.
- delays during transport, i.e. held at a border or delayed during transport for rail operational reasons.

Another issue is when the rail car is 'empty' being returned by the customer, even though the rail car is 'empty uncleaned' it still may have some liquid in it, and if the rail car is not blown down correctly then the safety valves may operate

Therefore the calculation of the holding time before each journey and marking the tank plate may not reflect the actual holding time that is attainable during transport, for the above reasons.

8. Therefore EIGA proposes the following for RID only. *Text in italic EIGA addition.*

4.3.3 Insert the following new sub-section:

"4.3.3.5 General provisions for the use of RID/ADR tanks for the carriage of refrigerated liquefied gases

4.3.3.5.1 Actual holding time

Tanks should only be offered for carriage when the condition of the contents is such that the holding time stamped on the plate or marked on the tank will be achieved.

~~4.3.3.5.1.1 The actual holding time shall be calculated for each journey in accordance with a procedure recognized by the competent authority, on the basis of the following:~~

~~(a) The reference holding time for the refrigerated liquefied gas to be carried (see 6.8.3.1.7.2) (as indicated on the plate referred to in 6.8.3.5.4);~~

~~(b) The actual filling density;~~

~~(c) The actual filling pressure;~~

~~(d) The lowest set pressure of the pressure limiting device(s).~~

4.3.3.5.1.2 1 The actual holding time shall be marked either on the tank itself or on a metal plate firmly secured to the tank, in accordance with 6.8.3.5.6.

4.3.3.5.1.3 2 Tanks shall not be offered for carriage:

(a) Unless the actual holding time for the refrigerated liquefied gas being carried has been determined in accordance with 6.8.2.4.2 or 6.8.3.1.7 and the tank is marked in accordance with 6.8.3.5.6; and

(b) Unless the duration of carriage, after taking into consideration any delays which might be encountered, does not exceed the actual holding time."

Add a new paragraph at the end of 6.8.2.4.2

Special requirements applicable to class 2.

The effectiveness of the insulation system should be checked at the time of periodic inspection in accordance with 6.8.3.1.7.3. and a new reference holding time determined from 6.8.3.1.7.2 should be stamped on the plate or marked on the tank.

6.8.3.1 Insert the following new paragraphs:

"6.8.3.1.7 General provisions for the design and construction of tanks intended for the carriage of refrigerated liquefied gases

6.8.3.1.7.1 A reference holding time shall be determined for each refrigerated liquefied gas intended for carriage in a tank.

6.8.3.1.7.2 The reference holding time shall be determined by a method recognized by the competent authority on the basis of the following:

(a) The effectiveness of the insulation system, determined in accordance with 6.8.3.1.7.3;

(b) The lowest set pressure of the pressure limiting device(s);

(c) The initial filling conditions;

(d) An assumed ambient temperature of 30 °C;

(e) The physical properties of the individual refrigerated liquefied gas intended to be carried.

6.8.3.1.7.3 The effectiveness of the insulation system (heat influx in watts) shall be determined by type testing the tank when new or at the time of periodic inspection in accordance with a procedure recognized by the competent authority. This test shall consist of either:

- (a) A constant gas pressure test (for example at atmospheric pressure), when the loss of refrigerated liquefied gas is measured over a period of time; or
- (b) A closed system test when the rise in pressure in the shell is measured over a period of time.

When performing the constant pressure test, variations in atmospheric pressure shall be taken into account. When performing either test, corrections shall be made for any variation of the ambient temperature from the assumed ambient temperature reference value of 30 °C.

~~NOTE: For the determination of the actual holding time before each journey, refer to 4.3.3.5.1.1."~~

6.8.3.5.4

~~Insert the following indent at the end:~~

~~"• Reference holding time (in days or hours)."~~

6.8.3.5.6 ~~Insert the following paragraph at the end:~~

~~"(e) For tanks for refrigerated liquefied gases:~~

~~Actual holding time for gas being carried _____ days (or hours)."~~
