



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**

Geneva, 21 September – 1 October 2021

Item 2 of the provisional agenda

Tanks**Mandatory fitment of safety valves to tanks carrying
flammable liquefied gases****Transmitted by Liquid Gas Europe on behalf of
the BLEVE working group* ** *****

1. Following on from the decisions taken at the Joint Meeting in Autumn 2020 (see report in ECE/TRANS/WP.15/AC.1/158) relating to the work of the BLEVE working group three measures were prioritised: (a) installation of metallic mudguards, (b) installation of engine fire suppression systems and (c) installation of safety valve(s). The proposals for (a) and (b) are being dealt with by WP.15 and this document therefore sets out proposals only for item (c); the installation of safety valves.
2. Research has shown that safety valves will be more effective in preventing a BLEVE if used in conjunction with the protective measures mentioned in paragraph 1, as safety valves alone are not certain to prevent a BLEVE produced by full fire engulfment. Therefore, it is important that cabin fires are avoided, and the expansion of tyre fires are also avoided, through implementing measures (a) and (b).
3. As tank-wagons do not contain rubber tyres, engines, fuels and cabins, and additional constraints exist in this case (e.g. interaction with overhead powerlines), safety valves may not be necessary in this case. Therefore, this proposal is mainly for the ADR. However, as tank-containers may be carried both on wagons and road vehicles, they should be protected with a safety device, therefore RID is also affected.
4. The following sets out the proposals for the amendment of 6.8.3.2.9 so that it becomes a mandatory requirement to fit safety valve(s) to all tanks that may carry flammable liquefied gases. These additional requirements have been adapted from Chapter 6.7, as Chapter 6.8 did

* A/75/6 (Sect.20), para 20.51.

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not currently contain the necessary requirements. This proposal is limited to gases, as tanks carrying liquids are already equipped with devices preventing overpressure.

5. To aid emergency services the proposal also includes an identification letter that will be displayed before the Hazard Identification Number (HIN), this will also require a new paragraph (5.3.2.3.3).

6. Additionally, two new transitional measures will also be required in 1.6.3 and 1.6.4. Retrofitting safety valves into the existing tanks may present technical difficulties, therefore this measure is only intended for new tanks manufactured after 31 December 2023.

Proposal 1: amendments to 6.8.3.2.9

New text is underlined and deleted text is ~~struck through~~.

Existing text:

“6.8.3.2.9 Tanks intended for the carriage of compressed or liquefied gases or dissolved gases, may be fitted with spring-loaded safety valves. These valves shall be capable of opening automatically under a pressure between 0.9 and 1.0 times the test pressure of the tank to which they are fitted. They shall be of such a type as to resist dynamic stresses, including liquid surge. The use of dead weight or counter weight valves is prohibited. The required capacity of the safety valves shall be calculated in accordance with the formula contained in 6.7.3.8.1.1.

Safety valves shall be designed to prevent or be protected from the entry of water or other foreign matter which may impair their correct functioning. Any protection shall not impair their performance.”

Proposed new text:

“6.8.3.2.9 Tanks intended for the carriage of flammable compressed or liquefied gases ~~shall or dissolved gases, may~~ be fitted with spring loaded safety valves. Tanks intended for the carriage of compressed or non-flammable liquefied gases or dissolved gases, may be fitted with safety valves. For compressed, liquefied or dissolved gases, safety valves, where fitted, shall meet the requirements of 6.8.3.2.9.1 to 6.8.3.2.9.5.

6.8.3.2.9.1 Safety ~~These~~ valves shall be capable of opening automatically under a pressure between 0.9 and 1.0 times the test pressure of the tank to which they are fitted. They shall be of such a type as to resist dynamic stresses, including liquid surge. The use of dead weight or counter weight valves is prohibited. The required capacity of the safety valves shall be calculated in accordance with the formula contained in 6.7.3.8.1.1.

Safety valves shall be designed to prevent or be protected from the entry of water or other foreign matter which may impair their correct functioning. Any protection shall not impair their performance.

6.8.3.2.9.2 Unless a tank in dedicated service is fitted with an approved safety valve constructed of materials compatible with the load, the safety valve shall comprise a frangible disc preceding the safety valve. The space between the frangible disc and the safety valve shall be provided with a pressure gauge or a suitable tell-tale indicator. This arrangement permits the detection of disc rupture, pinholing or leakage which could cause a malfunction of the safety valve. The frangible discs shall rupture at a nominal pressure 10% above the start-to-discharge pressure of the safety valve. The frangible disk shall not reduce the required discharge capacity or correct operation of the safety valve.

6.8.3.2.9.3 Connections to safety valves shall be of sufficient size to enable the required discharge to pass unrestricted to the safety valve. No stop-valve shall be installed between the shell and the safety valve except when duplicate safety valves are provided for maintenance or other reasons and the stop valves

servicing the safety valve actually in use are locked open or the stop-valves are interlocked so that at least one of the duplicate safety valves is always operable and capable of meeting the requirements of 6.7.3.8. There shall be no obstruction in an opening leading to a vent or safety valve which might restrict or cut-off the flow from the shell to the safety valve. Vents from the safety valve, when used, shall deliver the relieved vapour to the atmosphere in conditions of minimum backpressure on the safety valve.

- 6.8.3.2.9.4 Each safety valve inlet shall be situated on top of the shell in a position as near the transverse centre of the shell as reasonably practicable. All safety valve inlets shall under maximum filling conditions be situated in the vapour space of the shell and the devices shall be so arranged as to ensure that the escaping vapour is discharged unrestrictedly. For flammable liquefied gases, the escaping vapour shall be directed away from the shell in such a manner that it cannot impinge upon the shell. Protective devices which deflect the flow of vapour are permissible provided the required safety valve capacity is not reduced.”

Proposal 2: new 5.3.2.3.3

- “5.3.2.3.3 Tanks fitted with safety valves in accordance with 6.8.3.2.9 shall bear the letters ‘S’ immediately before the hazard identification number. The letters ‘S’ shall meet the requirements for hazard identification and UN numbers in 5.3.2.2.2.”

Proposal 3: Transitional measures

(ADR:)

- 1.6.3 Insert the following new transitional provision:

- “1.6.3.xx Fixed tanks (tank-vehicles) and demountable tanks constructed before 1 January 2023 in accordance with the requirements in force up to 31 December 2022 but which do not, however, conform to the requirements applicable as from 1 January 2023 regarding the fitting of safety valves in accordance with 6.8.3.2.9 may still be used.”

(RID/ADR:)

- 1.6.4 Insert the following new transitional provision:

- “1.6.4.xx Tank-containers constructed before 1 January 2023 in accordance with the requirements in force up to 31 December 2022 but which do not, however, conform to the requirements applicable as from 1 January 2023 regarding the fitting of safety valves in accordance with 6.8.3.2.9 may still be used.”