**Economic Commission for Europe**

Inland Transport Committee

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English

**Working Party on the Transport of Dangerous Goods**

**Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)**

**Thirty-fifth session**
Geneva, 26-30 August 2019
Item 3 (e) of the provisional agenda
**Implementation of the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN): matters related to classification societies**

# About item 4.u of informal document INF.11 of the thirty-fifth session

1. In informal document INF.11 ("Minutes of the seventeenth meeting of the informal working group of Recommended ADN Classification Societies") it is indicated at item 4.u:

> "Deflagration, detonation and steady burning (BV) – *doc 17 IG 04u*
>
> Paper was discussed and it was decided that BV will send this paper for further discussion to the Safety Committee."

2. The content of the doc 17 IG 04u of the IWG of Recommended ADN Classification Societies is copied hereafter.

**"3. Reminder: some definitions (1.2.1)**

"*Deflagration*: means an explosion which propagates at subsonic speed (see EN 13237:2011);"

*Note* → Deflagration arresters do NOT provide safety against detonations and NOT against endurance burning.

*Detonation*: means an explosion which propagates at supersonic speed and is characterized by a shock wave (see EN 13237:2011);"

*Note* → Detonation arresters provide safety for deflagration and detonation; they are NOT safe for endurance burning.

"Steady burning: Steady burning means combustion stabilized for an indeterminate period (see ISO 16852:2016);"

*Note* → *(Protego uses the wording "Endurance burning");*"

**3.1.** "*Device for the safe depressurization of cargo tanks* means a manually operated or remote-operated device which is mounted in such a way as to allow the cargo tanks to be depressurized in safety. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, the device shall be **deflagration safe** and **capable of withstanding steady burning** for the most critical substance in the vessel substance list. The deflagration safety shall be tested according to international standard ISO 16852:2016 and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU, ECE/TRADE/391 or at least equivalent) shall be supplied.

**3.2.** The deflagration safety may be ensured by an integrated flame arrester plate stack **capable of withstanding steady burning** or a flame arrester **capable of withstanding steady burning** (protection against deflagrations);"

**3.3.** "*Vacuum valve* means an automatically activated safety valve the purpose of which is to protect the cargo tank against unacceptable negative internal pressure. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, it shall be **deflagration safe** against atmospheric explosions of the most critical substance in the list of substances. The deflagration safety shall be tested according to international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU, ECE/TRADE/391 or at least equivalent) shall be supplied.

**3.4**. The deflagration safety may be ensured by an integrated flame arrester plate stack or a flame arrester (**protection against deflagrations**);"

**3.5.** "Self-contained protection systems means all devices which are intended to halt incipient explosions immediately and/or to limit the effective range of an explosion and which are separately made available on the market for use as self-contained systems. This includes flame arresters, high velocity vent valves, deflagration safe vacuum valves and devices for the safe depressurization of cargo tanks capable of withstanding a deflagration (see also Flame arrester, High velocity vent valve, Vacuum valve, Devices for the safe depressurization of cargo tanks and Deflagration);".

## 4. Contradiction between 1.2.1 and 9.3.2.22.4 (b):

**4.1.** In 9.3.2.22.4 (b) we read:

"If the list of substances on the vessel according to 1.16.1.2.5 is going to include substances that require explosion protection in accordance with column (17) of Table C of Chapter 3.2, then at the connection to each cargo tank, the venting piping and the **vacuum valve** shall be equipped with a flame arrester **capable of withstanding a detonation**;"

But in 1.2.1 (Definition) we read that when explosion protection is required the vacuum valve has to be just “deflagration safe”:

**4.2.** "***Vacuum valve*** means an automatically activated safety valve the purpose of which is to protect the cargo tank against unacceptable negative internal pressure. When the list of substances on the vessel according to 1.16.1.2.5 contains substances for which explosion protection is required in column (17) of Table C of Chapter 3.2, it shall be **deflagration safe** against atmospheric explosions of the most critical substance in the list of substances. The deflagration safety shall be tested according to international standard ISO 16852:2016[1] and evidence of compliance with the applicable requirements (e.g., conformity assessment procedure according to Directive 2014/34/EU, ECE/TRADE/391 or at least equivalent) shall be supplied. The deflagration safety may be ensured by an integrated flame arrester plate stack or a flame arrester (**protection against deflagrations**);"

**4.3.** It seems that there is a contradiction between the definition and the prescription; when the 1.2.1 (definition) requires a flame arrester capable of withstanding a deflagration the 9.3.2.22.4 (b) requires a flame arrester capable of withstanding a detonation. Deflagration arresters do not provide safety against detonations.

**4.4.** The IWG of Recommended ADN Classification Societies likes to ask the ADN Safety Committee to consider this contradiction and to decide about the necessary action.

## 5. Definition of "Self-contained protection systems":

**5.1**. In 1.2.1 Definitions we read that:

"Self-contained protection systems means all devices which are intended to halt incipient explosions immediately and/or to limit the effective range of an explosion and which are separately made available on the market for use as self-contained systems.

This includes:

- Flame arresters,
- High velocity vent valves,
- Deflagration safe vacuum valves
- And devices for the safe depressurization of cargo tanks capable of withstanding a deflagration (…);"

**5.2. In 3.2.3.1 Explanations concerning Table C we note:**

- Column (16) "Explosion group"

  Contains the explosion group of the substance.
  Values between square brackets indicate the explosion group II B subgroups to be used in selecting the relevant self-contained protection systems
  (flame arresters,
  vacuum relief valves,
  pressure relief valves/high velocity vent valves
  and devices for safe pressure relief of cargo tanks with integrated flame arrester plate stack).

**5.3.** In 1.2.1 the list of Self-contained protection systems is not exhaustive ("this includes …");

but in 3.2.3.1. it is a list limited to five devices.

It would be better:

- To have an exhaustive list of all the devices mentioned in the text of the ADN Regulations that must be considered as Self-contained protection systems ;
- To have this list only in 1.2.1.

**5.4.** In 1.2.1 it is indicated "deflagration safe vacuum valves" but in 3.2.3.1 it is indicated the "vacuum relief valves" (we could assume that both "deflagration" and "detonation" are considered here).

In 1.2.1"the pressure relief valves" are not included.

In 3.2.3.1 we would read "devices for the safe depressurization of cargo tanks …" instead of "devices for safe pressure relief of cargo tanks …".