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**COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS**

(Twentieth session,
Geneva, 7-16 December 1998,
agenda item 5 (b))

PROGRAMME OF WORK

Multimodal Portable Tank Transport

Portable tanks (Chapters 4.2 and 6.6)

Transmitted by the expert from Argentina

The expert from Argentina proposes that the proposal below be discussed by the Sub-Committee in the next biennium (refer to ST/SG/AC.10/C.3/30, para. 27).

Introduction

The tenth revised edition of the Recommendations include two chapters about portable tanks; they are growing steadily and, in our opinion, they are difficult to understand; we must facilitate to the user, the selection of the appropriate tank without complicating the design and the selection of the tanks. We would, therefore, not be in agreement with the inclusion of new specifications or new items referring to such tanks.

As much for the design as the use, including the labour of the surveyor and tester, the specifications must be user friendly, simple, easy to perform and exclude complicated and long calculations, impossible to resolve, that do not contribute to arise in the safety of the transport. Besides, the items to survey must be clear and subject to uniform interpretation.

We present to the Sub-Committee some difficulties in the design and the survey, and propose some solutions:

Design and construction requirements

6.6.2.1, page 396

When we define MAWP, in (b), we have the sum of the vapour pressure plus the partial pressure of the permanent gases.

The vapour pressure is difficult to calculate when there are two or more substances in the mixture or solution, the expression is: $x_1 p^{\circ}_1 - x_2 p^{\circ}_2 + \dots$, where x is the fraction molar of each substance of p°_i is the vapour pressure of the pure component.

The pressure of the permanent gases is the function of the volume of the ullage space and the mola fraction (n_i) of each component, to determine its partial pressure (p_i), applying the gases equation ($p_i V - n_i RT$) and summing each partial pressure, the volume V is low, (the tank is full to 95% or more) and the contribution of the last pressure is low too, and its determination only complicates the calculation; it could be deleted; the first pressure could be calculated or determined in a test, at 65°C and multiplied by a factor greater than 1, for example, from 1.05 to 1.2 and avoid the calculation of partial pressure of the air and the permanent gases.

When we define Design pressure, in (b), we have a similar problem; the term (iii) “a head pressure determined on the basis of the dynamic forces...” is included; but the calculation of “dynamic forces” is not presented; we think it has to be included and clearly specified, or delete all the (b) criteria; anyway (c) criteria brings a sufficient minimal safety level.

Inspection and testing

6.6.2.19 Inspection and testing, page 409

The test pressure and the hydraulic pressure test present some difficulties:

In page 396 we have: Test pressure means the maximum ...during the hydraulic pressure test...

In page 409 we would have to use the same terms, but in 6.6.2.19.3 the initial inspection is referred to the pressure test, and we understand, according to the definition of page 396 that it includes the hydraulic test.

The 6.6.2.19.4 says that the 5-year inspection includes a hydraulic pressure test; we think would be important to use the same terms in the two paragraphs.

So we could include “hydraulic” in the 6.6.2.19.3 or delete that word in the 6.6.2.19.4.

The initial, 2.5 periodical and 5-year periodic inspections, have some practical problems.

6.6.2.19.2 (409) Initial inspection:

- a pressure test, 6.6.2.1 (396) means hydraulic test
- a leakproofness test, 6.6.2.1 (396).

6.6.2.19.5 (409) 2.5 years periodic

- a leakproofness test, 6.6.2.1 (396)

6.6.2.19.4 (409) 5 years periodic

- a hydraulic pressure test (it is equivalent to pressure test 6.6.2.1 (396)
If the equipment has been pressure tested separately, it shall be subjected together after assembly to a leakproofness test 6.6.2.1 (396).

In the initial test, the pressure test (hydraulic) is not a problem, and shall be made to test the shell. The test time is not specified and we can perform it in some minutes or hours.

In the initial test, the leakproofness test is not specified clearly; we think it can be carried out with air. If the tank has a frangible disk and relief valve, the disk has not to be put and in the test, we probe the relief valve and the manometer (if is included); as a general rule we do not test the frangible disk. Anyway the time is not defined, so we could perform it in some minutes or hours.

When the tank is ready to use, we cannot do a new hydraulic test with water to test the equipment. If we want to test the level gauger, for example, we cannot test it with air; anyway sometimes water can be dangerous for the gauger or to other equipment; the only possibility is testing the equipment when the tank is filled with a product.

In the 2.5 year periodic inspection test, including a leakproofness test, in some cases, air could not be permitted to perform, so we would have to use, for example, nitrogen; the frangible disk is in position, and it is not possible to test the relieve valve.

The 5 year periodic inspection includes a hydraulic pressure test. To perform it, we have to take a part the frangible disk, the relief valve and the manometer (if there is any), flood with water and pressure the tank; sometimes the water could yield a corrosive or explosive mixture, and create a problem in the task.

Subsequently, clean and dry the tank, mount the relief valve, and perform the leakproof test similar to the initial test. Note that when the frangible disk is removed, it cannot be remounted in position because its gasket has failed, and has to be replaced.

To us, it is very important to have one uniform interpretation for the approval and testing of portable tanks, because currently there are dark grey borderlines, and it is difficult to ensure the uniform quality of the tank.
