

## **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**

Bern, 21-25 March 2011

Item 2 of the provisional agenda

##### **Tanks**

### **Accident reporting concerning a collapsed tank-wagon due to depressurisation**

#### **Transmitted by the Government of France**

1. The expert from France would like to report the first elements concerning an accident that happened on 27 December 2010.
2. The event happened recently and it took time to gather the relevant data therefore this is only available as a late INF document.
3. However it appeared important to us to inform the Joint Meeting and the Tank Working Group in order to initiate a discussion that would allow to go into more details at the September session.

#### **Description of the event**

4. An empty unloaded uncleaned tank wagon containing residues of butadiene (UN 1010) spent some time under low temperature conditions (from the date of unloading 20 December to the 27 December). The temperature reached a minimum of -18°C on 27 December.
5. At that moment the tank collapsed due to pressure difference probably caused by the liquefaction of butadiene.

## INF.31



6. The remaining mass of the product in the tank was estimated at 870 kg.
7. The accident did not lead to major damage (except for the tank itself) because at that time the wagon was stopped inside a marshalling yard. But given the fact that the dimensions of the deformed tank exceeded the rail gauge this could have led to more serious consequences in case of a moving tank-wagon on the network.

### **Tank characteristics**

Date of construction: 1968

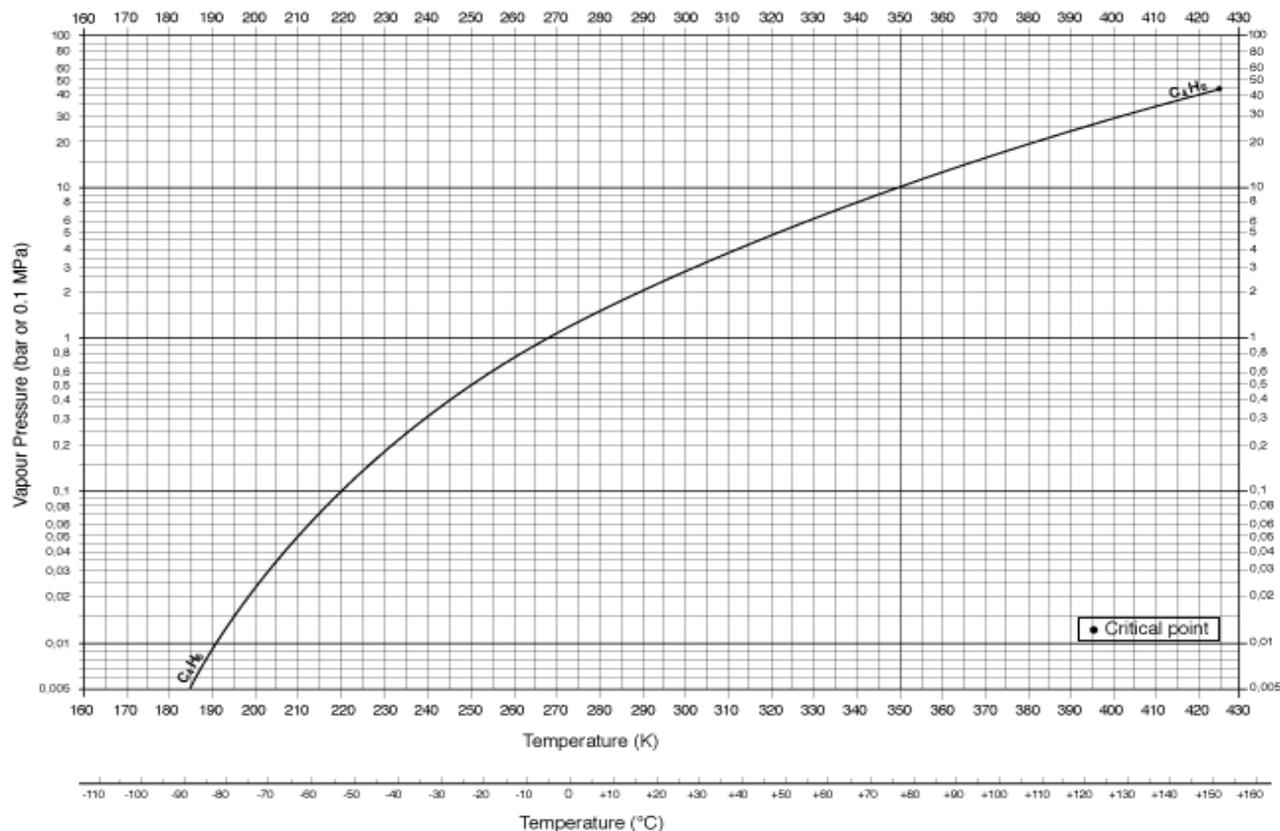
Tank-code: P14BH

Capacity: 116 000 l

Acceptable depressurisation: 0.35 bar at -20°C.

### **Comments**

8. The requirements in 6.8.2.1.7 concerning protection against the risk of deformation resulting from a negative internal pressure were modified in 2003.
9. The tank is old but the external design pressure is almost the same as the value defined in 6.8.2.1.7 (0.35 bar instead of 0.4 bar).
10. The pressure/temperature curve of butadiene shows that between -15°C and -20°C the pressure differential reaches the value of the external design pressure of this specific tank (explaining the deformation) but also the value of 0.4 bar defined in 6.8.2.1.7.



## Questions

The Joint Meeting and the Tank Working Group in particular are invited to address the following questions.

- 1) Are the current requirements concerning protection against the risk of deformation sufficient ?
- 2) Is it desirable and technically feasible to reach a high enough performance level to guarantee that no deformation will occur at the lowest temperatures?
- 3) If designing such tanks is not feasible, would it be relevant to require during certain periods when temperatures are very low, for substances where pressure differences may occur, specific operational procedures in order to maintain a certain pressure inside the empty tank (for instance by injecting nitrogen after emptying)?  
(In fact such a procedure is implemented for the unloader and usually works well, but at that moment this procedure was not followed properly).

## Further proposals

Depending on the orientations given by the Joint Meeting, the expert from France will prepare a more detailed proposal at a next session.