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Working Party on the Transport  
of Dangerous Goods

Joint Meeting of the RID Safety Committee  
and the Working Party on the Transport  
of Dangerous Goods  
(Geneva, 9-13 September 2002)

**INFORMATION FROM THE GOVERNMENT OF GERMANY CONCERNING  
AN ACCIDENT WITH A BATTERY VEHICLE CONTAINING HYDROGEN**

**Transmitted by the Government of Germany\***

The secretariat has received from the Central Office for International Carriage by Rail (OCTI) the proposal reproduced below.

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\* Circulated by the Central Office for International Carriage by Rail (OCTI) under the symbol OCTI/RID/GT-III/2002/26.

## **Introduction**

This document refers to informal document INF.31 submitted to the RID/ADR Joint Meeting of 10 to 14 September 2001. Its purpose is to inform the Joint Meeting of the current status of this affair in Germany.

### **Established facts:**

In battery vehicles with 9 to 18 tubes per vehicle, each containing 1,200 to 2,600 litres, each tube is individually closed. The closing valves are normally installed at the rear of the vehicle. Currently there is no adequate rear protection against collisions for the technical equipment for gases, including the closing valves.

In order to increase the protection of the technical equipment for gases in the event of rear collision accidents and prevent leaks consideration is given to the following:

1. Inclusion of a binding provision in the regulations, in section 4.2.4, for rear protection in accordance with prEN 13807 "Transportable gas cylinders - Battery vehicles - Design, manufacture, identification and testing", in addition to
2. Installation of protective hoops for the valves and
3. Replacement of brass valves by valves made of special steel.

In order to check the efficiency of the measures in 2. and 3., BAM has carried out non-destructive static load testing.

The brass valves used to date were compared with special steel valves with protective hoops by subjecting them to pressure at an angle of 10° in a hydraulic test machine until they failed.

The tests were carried out by trajectory adjustment. The piston stroke and the pressure were recorded.

### **Results:**

The unprotected brass valves gave way to much lower pressures and smaller strains than the special steel valves with a means of protection (protective collars round the valves). The special steel valves did not give way and their casings did not show external cracks following the stress.

On the basis of the trajectory curve-test force the strain energy applied for a battery vehicle with nine cylinders can be estimated as follows:

- brass valves with no protective hoop, approx. 6 kNm
- special steel valves with a protective device, approx. 150 kNm.

**Assessment according to the current status of the test:**

The measures proposed considerably increase the protection of the technical equipment for gases. Other tests should be carried out before deciding to apply these measures. In particular, it is necessary to examine what the separate influence of the special steel valves and the protective device is on the protection it is possible to achieve.

Germany will submit a specific proposal for the amendment of RID/ADR in relation with a detailed presentation of the test results.

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