COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS AND ON THE GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS

Sub-Committee of Experts on the Transport of Dangerous Goods (Twentieth session Geneva, 5-11 December 2001, Agenda item 2)

ADDITIONAL PROVISONS FOR THE TRANSPORT OF GASES

LIGHTWEIGHT METAL FLIGHT CYLINDERS FOR HOT AIR BALLOONS

Transmitted by the Expert from the United Kingdom

1. The expert from the United Kingdom proposes that the UN Model Regulations are amended to permit specified types of lightweight cylinders to be transported for the purposes of hot air ballooning. Currently these are addressed in European Land Transport by a multilateral special agreement.

2. Hot air balloons use hydrocarbon gases, principally UN 1978 Propane but also UN 1011 Butane and UN 1965 Hydrocarbon Gas Mixture, liquefied, NOS as fuel. The fuel is transported by road before and after flights in the cylinders that accompany the balloon in flight. These flight cylinders are especially designed and built to be lightweight and are engineered to exacting standards. They are tested and inspected to high standards in accordance with the requirements of local airworthiness authorities to a schedule prescribed by the manufacturer. However, they do not fully meet the requirements of chapter 6.2 of the Model Regulations.

Justification

3. They have an equivalent level of safety to cylinders which are in normal use for the following reasons:

   (a) Their design is type-approved by local civil aviation authorities who specify requirements for strength, impact resistance, burst pressure, valve design, contents gauges, maximum filling ratio; etc.

   (b) Balloon cylinders are never refilled on an exchange basis. Each owner retains his/her own cylinders and consequently has responsibility for maintenance and periodic examinations;

   (c) The cylinders are fitted with a padded cover and are installed in the balloon gondola. The cylinders are removed for filling.

Statistics

4. Approximately 9500 stainless steel balloon cylinders have been produced over the last 15 years.

5. Stainless steel balloon cylinders have been in world-wide use for 15 years and titanium cylinders in use for 10 years. There are no reported incidents of these cylinders being ruptured or leaking in land transport.

6. The United Kingdom ballooning industry, which is a major source of such cylinders, exports to over 50 countries world-wide.

Proposal

Insert at end of Chapter 6.2 the following:

6.3 Balloon Flight Cylinders

6.3.1 Gas pressure receptacles with a wall thickness calculated for a maximum operating pressure at +40°C containing UN 1011, 1965 or 1978 may be transported provided that the following requirements are met:

(a) the receptacles must be made from rolled and annealed pure titanium with the minimum requirements of (R_m>450Mpa, ε_A>20%), where ε_A = elongation after fracture, or made from austenitic steel;

(b) the main body of the receptacles are provided with an outer, water resistant protective layer at least 25mm thick made from foam or similar material;

(c) in addition to the other labelling requirements of this chapter, the gas cylinders are marked with a clearly visible label stating that the receptacles are only for the operation of hot air balloons.

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