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**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****Fifty-fourth session**

Geneva, 26 November-4 December 2018

Item 2 (f) of the provisional agenda

**Recommendations made by the Sub-Committee on its fifty-first,  
fifty-second and fifty-third sessions and pending issues:  
miscellaneous pending issues****Proposal to include special provision 653 of the ADR in the  
Model Regulations****Submitted by the European Industrial Gases Association (EIGA)\*****Introduction**

1. At the fifty-third session of the Sub-Committee EIGA proposed to include the exception that is provided in Special Provision 653 of the *European Agreement concerning the International Carriage of Dangerous Goods by Road* Regulation since 2007. The decision was partly based on the opinion of the Bundesanstalt für Materialforschung und Prüfung (BAM) (Federal Institute for Materials Research and Testing) that there was an infinitely small probability of leakage during transport and even if a leak were to occur the hazard would not present a significant risk. For more details see the justification under paragraph 6.

2. The primary concern raised during the fifty-third session was that transport by air should not be authorized. Generally, the majority of experts did not object to including the exception for road, rail and sea transport. In addition, some experts indicated that they preferred if a condition of the special provision include a requirement that all cylinders be leak tested prior to being offered for transport. Based on these comments the proposal has been revised as provided below.

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\* In accordance with the programme of work of the Sub-Committee for 2017–2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, para. 14).

## Proposal

3. SP 653 affords a rational and safe exception that should be included in the Model Regulations to allow it to be used for transport globally. It is proposed that the following new special provision be included in the Model Regulations.
4. In the Dangerous Goods List apply SP XYZ to the entries for UN1013 Carbon Dioxide, UN1046 Helium, compressed and UN1066 Nitrogen, compressed.
5. In Chapter 3.3 include a new special provision XYZ as follows:

“XYZ Except when transported by air, the carriage of this gas in cylinders having a test pressure capacity product of maximum 15.2 MPa.litre (152 bar.litre) is not subject to the other provisions of these Model Regulations if the following conditions are met:

  - The provisions for construction and testing of cylinders are observed;
  - The special packing provisions for goods of Class 2 in 4.1.6 are met;
  - The cylinders are inspected prior to filling and are leak tested after filling;
  - The cylinders are contained in outer packagings which meet the requirements of Part 4. The general provisions of packing of 4.1.1.1, 4.1.1.2 and 4.1.1.5 to 4.1.1.7 are met;
  - The cylinders are not packed together with other dangerous goods;
  - The total gross mass of a package does not exceed 30 kg; and
  - Each package is clearly and durably marked with "UN 1006" for argon compressed, "UN 1013" for carbon dioxide, "UN 1046" for helium compressed or "UN 1066" for nitrogen compressed. This marking is displayed within a diamond-shaped area surrounded by a line that measures at least 100 mm by 100 mm.”

## Justification

6. In TRANS/WP.15/AC.1/2005/53 presented by the Expert of Germany, it was stated:

*“Moreover, in the opinion of the Bundesanstalt für Materialforschung und Prüfung (BAM) (Federal Institute for Materials Research and Testing), it may be assumed, depending on the type of valves tested for these carbon dioxide cylinders, that there is an infinitely small probability of a valve ceasing to be airtight during carriage. If the valve of a small carbon dioxide cylinder is not airtight, this is apparent directly after filling at the filling facility - the filled cylinder will already be empty at the start of carriage - or the airtightness deficiency is so slight that the quantities of carbon dioxide released over time into the wagon/vehicle do not cause an appreciable increase in the atmospheric concentration of carbon dioxide.”*
7. EIGA agrees with the statement in TRANS/WP.15/AC.1/2005/53, and to back this up has carried out calculations based on vehicles in use. A valid point is that a leaking valve is likely to leak immediately after filling and not be leaking when loaded into the vehicle. Taking the scenario of a small van having a load compartment volume of 4100 litres and no ventilation, an instant release of 152 litres of carbon dioxide would produce an increase the level of carbon dioxide to approximately 3.5% but would not produce an asphyxiating atmosphere. The reality is that an instantaneous release would not occur as the carbon dioxide would sublime to solid carbon dioxide, dry ice. In such an event it would be slow release of the approximately 0.75 Kg of carbon dioxide.

8. For the other gases proposed, UN 1006 argon compressed, UN 1013 carbon dioxide, UN 1046 for helium compressed or UN 1066 nitrogen compressed a rapid discharge of the contents of one cylinder in a small closed van would not produce an asphyxiating atmosphere.

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