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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

Thirty-sixth session
Geneva, 30 November – 9 December 2009
Item 3 of the provisional agenda

LISTING, CLASSIFICATION AND PACKING

Materials compatibility requirements for gases in pressure receptacles

Transmitted by the expert from the United Kingdom¹

Introduction

1. The Sub-Committee will recall that the expert from the United Kingdom presented informal document INF.51 at the July 2009 session which addressed the problem of materials compatibility for pressure receptacles and how the requirements for packaging compatibility for the proportion of substances in a mixture or solution should be reflected in regulatory text. The expert from the United Kingdom put forward draft proposals and as there was not sufficient time for detailed discussion, promised to submit his paper formally for the December session. Below are the discussion points and proposals from the informal paper reproduced again for consideration by the Sub-Committee.

¹ In accordance with the programme of work of the Sub-Committee for 2009-2010 approved by the Committee at its fourth session (refer to ST/SG/AC.10/C.3/68, para. 118 (b) and ST/SG/AC.10/36, para. 14).

2. The Sub-Committee will recall discussions during the last biennium related to an incident involving a pressure receptacle containing ethyl chloride at Dubai airport. In particular, the expert from the United States of America led a correspondence working group on the classification of mixtures to examine various issues raised by this incident.

3. The terms of reference for the working group were appended to report ST/SG/AC.10/C.3/66 as Annex III. The Sub-Committee successfully addressed the issue of clarifying the process of determining the proper description of mixtures and solutions in Part 2 of the Model Regulations, thereby meeting points one and two of the Working Group terms of reference. However, there was not enough time to address all of the other issues identified in the terms of reference.

4. The expert of the United Kingdom believes that it is important now to address the issue of materials compatibility. The Working Group terms of reference include:

- “(a) To review the requirements for packaging compatibility related to the presence of a proportion of a substance in a mixture or a solution;
- (b) To assess how the Model Regulations clearly address regulatory provisions from those provisions contained in guidance material or standards”.

5. Whilst it may be arguable whether the substance involved in the Dubai incident had been appropriately assigned to the proper shipping name used, it is clear that there was an issue of the compatibility of the gas contained with the material of the pressure receptacle used for its transport i.e. aluminium alloy. In looking more closely at this aspect of the incident, the expert from the United Kingdom believes that text in various parts of the Model Regulations are not sufficiently clear in respect of materials compatibility. In particular, references to ISO standards 11114 – 1:1997 and 1114 – 2:2000 might appear to be in conflict with other mandatory requirements in the Model Regulations. It is the belief of the expert of the United Kingdom that the ISO standards were written with the intention of providing guidance for users of pressure receptacles. The standard makes reference to competent persons making professional judgements on whether aluminium receptacles may be appropriate to use in transporting certain gases. However, the regulatory text of the Model Regulations makes clear that such cylinders can not be used for those gases. Nevertheless, the way the standards are referred to and where these references are included in the text of the Model Regulations appears to permit conflicting interpretations of the precise requirements. Clearly, this is unacceptable when transposed into the mandatory modal transport regulations and beyond.

6. The expert of the United Kingdom invites the Sub-Committee to consider this issue and to offer guidance on how best to address the concerns that have been raised. As an aid to that consideration, the expert of the United Kingdom has examined the relevant texts and suggests that the following amendments might resolve the problem. Subject to the views of other Sub-Committee participants, the expert from the United Kingdom would be willing to submit formal proposals for the next session of the Sub-Committee.

Draft proposed amendments

7. In Section 4.1.4.1, Packing Instruction P200 paragraph 4:
- Amend the first line “Keys for the column “Special packing provisions” to read “Special Packing Provisions”.
- In the first heading that reads “*Material compatibility (for gases see ISO 11114-1:1997 and ISO 11114 – 2:2000; amend to read “Material compatibility”.*
- Amend sub-paragraph a: “Aluminium alloy pressure receptacles are not authorized” to read “Aluminium alloy pressure receptacles shall not be used”.
- Amend sub-paragraph d: “When steel pressure receptacles are used, only those bearing the “H” mark shall be authorized” to read “Steel pressure receptacles shall bear the “H” mark in accordance with 6.2.2.7.3 (p)”.
8. In Section 4.1.6 Special packing provisions for goods for Class 2:
- Amend the second sentence of 4.1.6.1.2 “The provisions of ISO 11114 -1: 1997 and ISO 11114 – 2:2000 shall be met as applicable.” To read “Material compatibility requirements of Packing Instructions P200, P203 and P205, as appropriate, shall be met.” Add a new third sentence to read “Additional guidance may be found in ISO 11114 -1: 1997 and ISO 11114 – 2:2000 but shall not take precedence over these Regulations.”.
9. In Section 6.2.2.2 Materials:
- Amend the final sub-clause of the sentence before the table that reads “...the following standards apply to material compatibility:” to read “....., the following standards provide additional guidance but shall not take precedence over these Regulations:”
10. In reviewing the guidance contained in ISO standard 1114-1:1997 and the new draft standard ISO/DIS 11114-1:2009, the expert of the United Kingdom has noticed, with some concern, that a number of gases are specifically identified as not being suitable for filling into aluminium alloy pressure receptacles because of concerns of compatibility. However, these gases do not currently attract the special packing provision “a” in the Tables in Packing Instruction P200. These gases are:

P200 TABLE NO.

| | | |
|---------|------------------------------|---|
| UN 1741 | BORON TRICHLORIDE | 2 |
| UN 1008 | BORON TRIFLUORIDE | 2 |
| UN 1911 | DIBORANE* | 2 |
| UN 2189 | DICHLOROSILANE* | 2 |
| UN 1052 | HYDROGEN FLUORIDE, ANHYDROUS | 3 |
| UN 2418 | SULPHUR TETRFLUORIDE* | 2 |
| UN 1076 | PHOSGENE | 2 |
| UN 1859 | SILICON TETRAFLUORIDE | 2 |

* = on the basis of draft standard ISO/DIS 1114-1:2009

11. Subject to review by the Sub-Committee, the expert from the United Kingdom proposes that letter “a” in the special packing provisions be assigned against these gases in the appropriate tables of Packing Instruction P200 and that a new entry for UN 1295 TRICHLOROSILANE be included in Table 3 with special packing provision “a” assigned with appropriate entries, to be decided, for the other columns of Table 3.
