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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

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Item 9 of the provisional agenda

Any other business

Carriage of pressure receptacles approved by the Department of Transportation of the United States of America (DOT)

Transmitted by the European Industrial Gases Association (EIGA)^{1, 2}

Introduction

1. At the Joint Meeting in September 2015 the representative of EIGA submitted informal document INF.33 summarising the progress that had been made regarding the carriage of pressure receptacles approved by the Department of Transportation of the United States of America (DOT).

2. This followed on from formal paper ECE/TRANS/WP.15/AC.1/2015/4 presented at the March 2015 session of the Joint Meeting where EIGA had initiated the discussions on either modifying the text of RID/ADR or continuing with another multilateral agreement. Following the discussions at the March Joint Meeting and a suggestion that EIGA and the Compressed Gases Association (CGA), were going to jointly submit a petition to the DOT for a rulemaking on the recognition in the United States of pressure receptacles approved by contracting parties to RID or ADR in return for acceptance of the carriage according to

¹ In accordance with the draft programme of work of the Inland Transport Committee for 2016-2017, (ECE/TRANS/WP.15/2015/19 (9.2)).

² Circulated by the Intergovernmental Organisation for International Carriage by Rail (OTIF) under the symbol OTIF/RID/RC/2016/8.

RID, ADR and ADN of pressure receptacles approved by the DOT. See (ECE/TRANS/WP.15/AC.1/138, paras. 43-47),

3. At the September Joint Meeting, several delegations remarked that the timeframe for this work was unknown, as were the expected results. Moreover, the continuation of the multilateral agreement M237 allowing the use of DOT receptacles for the carriage of gas between countries contracting parties to RID or ADR – which currently has only 15 signatories – depended solely on the will of each country with a possible interest.

4. Several delegations indicated that they would like more information from the industry on the reasons for this situation which has persisted for many years, for example:

- What are the gases concerned;
- What exactly are the current obstacles in transatlantic exchanges for the use RID/ADR, DOT and UN receptacles;
- What is the number of receptacles concerned;
- What are the problems linked to the filling of receptacles when they are exported from the United States to Europe or imported from Europe into the United States.

5. EIGA has worked with its members to assemble the information requested and this is given below. EIGA would also like to make the Joint Meeting aware of work that is being carried out at the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods. At the Sub-Committee meeting the question of mutual recognition of UN pressure receptacles has been raised and what are the barriers. EIGA along with CGA has been actively participating in this and as well advising delegates to the Sub-Committee meeting of the progress of the work at the Joint Meeting.

What are the gases concerned?

6. EIGA members have supplied the list of gases that they have been importing into Europe from the United States, and this is shown in Annex. These are specialist gases and not commonly available. It should be noted that the list of gases is not exhaustive as there may be new compounds not yet developed that need to be transported.

What is the number of pressure receptacles concerned?

7. From the information that has been supplied, the number of cylinders does not exceed 10 000 cylinders per year. When the total population of industrial gas cylinders is considered in Europe to be approximately 35 million, it is clear that this number represents a very small percentage.

What are the applications?

8. EIGA members have been able to advise that the applications for these products that they are aware of include:

- Production of glass fibre
- Semi-conductor production
- Telecommunications investigation
- Photovoltaic investigation

- Plasma etching of polysilicon wafers
- Doping polysilicon wafers
- LASERS
- Eye correction
- Medical research and applications
- UV pulsed laser deposition
- Lithography/medical disposables
- R&D/materials marking
- FPD silicon annealing
- Plant sciences
- Refrigeration research and development

There are other applications, usually in research and development, which the end user will not share with the supplier for commercial reasons.

Why is there a need in Europe for DOT pressure receptacles?

9. EIGA members were asked to explain why there is a need for DOT pressure receptacles to be transported from the United States to Europe and the reasons were summarised as:

- a) Customers demand US produced product in DOT cylinders. The reasons for this can fall in one or both of two categories:
 - i) The pressure receptacle fits into a dedicated item of (usually expensive) equipment.
 - ii) The gas that is being used is in a process that has been qualified using gas from one particular global facility. The user knows that the process works in the combined pressure receptacle package and is not prepared to requalify or compromise production. This is particularly true of the production of semi-conductors where no change is wished for or permitted.
- b) There is only one production site for the product, and that is in the United States. (It should be noted that the converse is true in that some products are only made in Europe and thus exported to the United States).
- c) Where some mixtures are concerned, stability of the mixture is critical for the application and only one facility is able to produce that globally. For example, a twenty component mixture can take six months to produce and test for stability, and the facility could be dedicated to producing just one type of mixture.

What exactly are the current obstacles in transatlantic exchanges for the use RID/ADR, DOT and UN receptacles?

10. It is the opinion of EIGA members that all UN pressure receptacles may be transported without restriction within ADR Contracting Parties but they cannot be “placed on the market” unless approved by an EU notified body or by the relevant contracting party. Thus an example is that a UN marked pressure receptacle from the United States may be imported, transported, stored in immediate storage, transported and emptied in an ADR

contracting party. The UN pressure receptacle may then be refilled and transported out of the region where ADR applies. The UN pressure receptacle cannot be used within an ADR contracting party.

11. Under multilateral agreement M237, DOT pressure receptacles may be imported into an ADR contracting party and importantly be stored at intermediate storage and then transported to the point of use. Without multilateral agreement M237, DOT pressure receptacles would have to be consigned directly to the point of use. Logistically, this would not be viable and by causing much larger stockholdings at customer premises.

12. Importing a UN pressure receptacle into the United States requires that the pressure receptacle has either a United States or Canadian approval. Thus a UN pressure receptacle from Europe without the “USA or CAN” approvals could not be carried from the port area. Below is a summary of the requirements for importing or exporting pressure receptacles into or out of the US prepared by CGA.

What are the problems linked to the filling of receptacles when they are exported from the United States to Europe or imported from Europe into the United States?

13. Filling for export from the USA

a) Title 49 of the United States Code of Federal Regulations (49 CFR) §171.23(a)(4) provides for the filling and transport of foreign cylinders for export; however, requalification (periodic inspection and test) of the cylinder is required in accordance with the United States’ requirements and must be repeated every five years. Requalification involving a method other than hydrotest (e.g. ultrasonic or acoustic emission) requires approval or a special permit. (Note that, in the case of hydrotesting, the introduction of water into some pressure receptacles can damage the conditioning of their internal surfaces.)

b) 49 CFR §171.23(a)(4)(ii) only allows for foreign cylinders for export to be filled to the maximum filling density or filling pressure permitted in the United States.

NOTE: 49 CFR §171.23(a)(5) only provides for the filling and transport of DOT specification cylinders or recognised UN cylinders (i.e. with “USA” or “CAN” approval) without pressure relief devices (PRDs) for export. Foreign pressure receptacles may not be filled and transported for export without PRDs (although this has been allowed through a special permit).

c) There are additional provisions in 49 CFR §171.12(a)(4) for the transport and use of certain Canadian cylinders in the United States.

14. Emptying imported cylinders in the USA

a) 49 CFR §171.23(a)(3) allows for the import of filled foreign cylinders for transport and discharge within a single port area, with approval. (Note that further transport and discharge beyond a single port area has been allowed through a special permit.) An application for such an approval (or special permit) requires demonstration of an equivalent level of safety to a comparable DOT specification or UN pressure receptacle.

b) There are additional provisions in 49 CFR §171.12(a)(4) for the transport and use of certain Canadian cylinders in the United States.

15. Transport for export from the USA

a) 49 CFR §171.23(a) requires cylinders transported in the United States under the ICAO Technical Instructions or IMDG Code to be in accordance with United States

specifications and requirements (e.g. DOT cylinders), except for certain cases (as detailed below).

b) 49 CFR §171.23(a)(4) provides for the filling and transport of foreign cylinders for export; however, requalification (periodic inspection and test) of the cylinder is required in accordance with United States' requirements and must be repeated every five years. Requalification involving a method other than hydrotest (e.g. ultrasonic or acoustic emission) requires approval or a special permit. (Note that, in the case of hydrotesting, the introduction of water into some pressure receptacles can damage the conditioning of their internal surfaces.)

c) 49 CFR §171.23(a)(4)(ii) only allows for foreign cylinders for export to be filled to the maximum filling density or filling pressure permitted in the United States.

NOTE: 49 CFR §171.23(a)(5) only provides for the filling and transport of DOT specification cylinders or recognised UN cylinders (i.e. with "USA" or "CAN" approval) without pressure relief devices (PRDs) for export.) Foreign pressure receptacles may not be filled and transported for export without PRDs (although this has been allowed through a special permit).

d) There are additional provisions in 49 CFR §171.12(a)(4) for the transport and use of certain Canadian cylinders in the United States.

16. **Transport for import to the USA**

a) 49 CFR §171.23(a) requires cylinders transported in the United States under the ICAO Technical Instructions or IMDG Code to be in accordance with United States specifications and requirements (e.g. DOT cylinders), except for certain cases (as detailed below).

b) 49 CFR §171.23(a)(3) allows for the import of filled foreign cylinders for transport and discharge within a single port area, with approval.

NOTE: Further transport and discharge beyond a single port area has been allowed through a special permit. An application for such an approval (or special permit) requires demonstration of an equivalent level of safety to a comparable DOT specification or UN pressure receptacle.

c) There are additional provisions in 49 CFR §171.12(a)(4) for the transport and use of certain Canadian cylinders in the United States.

What steps are EIGA members and others taking to minimise the problems?

17. EIGA members wish to see a permanent solution to the issue of moving pressure receptacles to and from the United States and the programme is:

a) Purchase where appropriate UN pressure receptacles with the regional approval that is "pi" or "USA & CAN".

Timescale: On going

b) Work with CGA to submit a special permit for rulemaking to allow European pressure receptacles of a type to be defined to be permitted to be imported into the United States for transport (carriage) and discharge as well as filling for export.

Timescale: Work in hand, anticipated to be submitted to DoT by second quarter of 2016; subsequent consultations and actions have unknown timing.

c) Work with European Competent Authorities to modify the text of RID/ADR to incorporate the text of multilateral agreement M237.

Timescale: On going

d) Work for an additional multilateral agreement to cover the transition until b) is complete.

Timescale: On going

Why is there a need for amendment to the text in RID/ADR and a multilateral agreement?

18. Whilst UN pressure receptacles are being purchased, not all cylinders will be transitioned to UN pressure receptacles and even with significant progress, there will be occasions when there is a demand in Europe for specialist products with the flexibility to have intermediate storage.

Annex

[English only]

Chemical name	Formula	UN Number
0.1% Methylsilane in H2		UN1954
Ammonia	NH3	UN 1005
B2H6 in H2		
Boron trichloride	BCl3	UN 1741
Boron trifluoride	BF3	UN 1008
Calibration Mixtures (N2 or quad-mixes (10 VPPM H2S+25 VPPM CO+2.2 VOL % CH4+18 VOL % O2 in N2)		
Carbon Monoxide	CO	UN 1016
Carbon Tetrafluoride (H-14) (CF4)		
Chlorine Trifluoride		UN 1749
Deuterated Silane		
Deuterium	D	UN 1957
Diborane	B2H6 mixtures	UN 1911
Dichlorosilane	SiH2Cl2	UN 2189
Dietil Tellerum		
Disilane	Si2H6	
Fluorine	F	UN 1045
GAS TYPE PT14-3GASIC22 (UN 3161) -		
Germane	GeH4	UN 2192
Germane Mixtures		
Germanium		UN 2192
Hexafluoroethane	C2F6	UN 2193
Hydrogen bromide	HBr	UN 1048
Hydrogen fluoride	HF	UN 1052
Hydrogen selenide	H2Se	UN 3526 & UN 2202
Krypton	Kr	UN 1056
Methyl Fluoride Methyl		
Methylsilane	SiH3CH3	
Mixes containing chlorine, phosphine or diborane		
Nitrous Oxide	N2O	UN 1070
Per/Octa/fluoropropane (H-218) (C3F)		
PH3 in H2		
Phosphine	PH3	UN 2199
Phosphorous Trifluoride 7X	PF3	(UN3308)
Propylene (C3H6)		UN 1077
Silicon tetrachloride	SiCl4	UN 1818
Sulphur Tetrafluoride		UN 1859
Tetramethylsilane	Si(CH3)4	UN 2749
Titanium tetrachloride	TiCl4	UN 1838
Trichlorosilane	SiHCl3	UN 1295
Trifluoromethane	CHF3	UN 1984
Trimethylsilane	SiH(CH3)3	UN 1954
Trimethylborane	C3H9B	UN 3160
Tungsten hexafluoride	WF6	UN 2196
Various multicomponent mixtures containing Fluorine + Argon/Helium/Krypton/Xenon/Neon		
Xenon	Xe	UN 2036