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## COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

### Sub-Committee of Experts on the Transport of Dangerous Goods

### REPORT OF THE SUB-COMMITTEE OF EXPERTS ON ITS EIGHTEENTH SESSION

(Geneva, 3-12 July 2000)

#### Annex 1

#### Report of the Working Group on Gas Receptacles and Multiple Elements Gas Containers (MEGCs)

#### General

1. The Working Group on Gas Receptacles and MEGCs met from 3 July to 6 July 2000 under the chairmanship of Mr. H. Puype (EIGA). Representatives of Canada, the European Commission, France, Germany, Switzerland, the United Kingdom, the United States of America, ISO, AEGPL, CGA, ECMA, and EIGA participated in the meeting.
2. The objective of the working group was to review document ST/SG/AC.10/C.3/34/Add 1 that presented the outcome of the discussions held during the second meeting of the working group taking into account the following documents 2000/31 (Canada), 2000/37 (Italy), 2000/38 (AEGPL) and 2000/51 (USA) and informal documents INF.13 (EIGA), INF.30 (D), INF.36 (UK), INFs 37, 38,

45 and Corr (AEGPL), INFs 35 and 44 (ISO), and a papers (no numbers) from Australia, the ECMA and from the CGA concerning receptacles for refrigerated liquefied gases.

3. Due note was taken of the remit to the working group given by the plenary meeting to complete the work this biennium, if possible, and concentrate on completing the proposals on MEGCs first. The working group decided that the best way forward was to concentrate on the controversial issues first, so that sufficient time was given to them.

### ISO Standards

4. Only published and dated standards would be listed. Standards which would not be published in time for this biennium were provisionally deleted. In order to keep the Model Regulations current, it was agreed to include a note that a more recently published version of the design standards could be used with the agreement of the competent authority.
5. The standards for composite gas cylinder, for cryogenic receptacles and the revised ISO 4706, would not be at a sufficiently advanced stage to be included this biennium, so they were provisionally deleted from the text and the relevant provisions reserved. The working group emphasised the need for these standards for future inclusion in the Model Regulations. Standards whose publication was imminent in 2000 were left in square brackets and will be removed in due time for the December session or deleted. The ISO representative agreed to urge the ISO secretariat to progress ISO 9809-3 to final vote and publication before the December meeting of the UNCETDG.
6. It was agreed for the time being to delete the CEN standards on the design and construction of LPG cylinders until there had been further technical exchange between European and North American experts, with a view to agreeing on a single standard for UN marked cylinders.
7. The notes on variable F-factor relating to the three ISO cylinder standards 9809-1, 7866 and 11120 were reworded to prevent regional limitations allowed for by the standards.
8. The status of the ISO standards was updated. Square brackets were removed from ISO 10297 and other standards which were published.

### Quality Assurance

9. The representatives from the USA outlined their national practices of approval which involved a significant involvement of the competent authority in approval of both the inspection body and the manufacturer and his facilities. The representative of the European Commission described the processes adopted in the European Community which relied upon empowerment of the inspection body to approve the manufacture of cylinders. The group agreed that the principle of traceability was paramount and that both approaches followed that principle.

10. Following discussion of the ISO Technical Report TR 14600, the group agreed that it was a good compromise between North American and European practice. As such it was a good basis for introducing the necessary elements of quality assurance into the model regulations. Terminology will need aligning and other editorial changes are required. Canada volunteered to provide the necessary excerpts for incorporation in the final proposal in due time.
11. In the discussion of TR 14600 a modified definition of Inspection Body was agreed.
12. The USA sought to include wording which required the specific approval of the inspection body at each manufacturing facility. This was not accepted by the other working group members. They considered that careful selection and monitoring of the inspection bodies and the guaranteed traceability ensured that the facility would perform as required.
13. A further proposal from USA that design type approvals should be linked to a particular manufacturing facility was also not included because it was already covered by the ISO design standards.

### Marking

14. After some debate it was agreed that markings for UN certified cylinders should be split into two sections, one for ready reference for the authorities (the certification markings) and these marking would be in a specific sequence. The second section covered the other essential markings some of which are dependent on the characteristics of the gas or receptacle. Since the decision caused major concern for the ISO standard as it would require a major change in its layout of the stamp marking, it was requested that the elements of the certification string would be as limited as possible. More particularly, it was asked to remove the test pressure from the certification string. The working group promised to review this and report back as soon as possible.
15. Canada expressed concern that working pressure would not be required as a mandatory marking on all pressure receptacles.
16. It was agreed not to include the tare for compressed or liquefied gases because it can vary according to the accessories used and would then require re-stamping. The tare, and other markings needed for operational reasons, however, may be marked if they do not conflict with the required markings.
17. The working group decided that the tare to be indicated for acetylene, dissolved UN 1001 had to include the saturation gas (S-TARE).

Pressure Relief Devices

18. The delegates expressed their views on the use of PRDs. It was recognised that the use of PRDs cannot be dissociated from different practices in the national markets and the national regulatory environment.
19. The previous agreement on prohibiting the use of PRDs on toxic gases with an LC<sub>50</sub> lower than or equal to 200 ml/m<sup>3</sup> and the compulsory use on CO<sub>2</sub> and N<sub>2</sub>O was confirmed.
20. A compromise was reached that consisted in maintaining the prerogative of the competent authority of the country of use to require the fitting of pressure relief devices to pressure receptacles.
21. The USA announced that they will be commissioning a university to undertake risk analysis work on the use PRDs.
22. CGA and EIGA will maintain close contact to foster world-wide harmonisation in the use of PRDs.
23. The UK proposed to contribute to further studies and invited collaboration by other countries to develop joint research programmes. The USA welcomed this and indicated that they were already exchanging information with experts in Germany and Canada.

General Packing Instructions and P200

24. The USA sought clarification on the determination of the filling ratios. CGA explained that they had been using different formulas and the tables published by the National Institute for Science and Technology in the USA and that until now only a few discrepancies with the proposed values had been found. Germany explained that most of the ADR/RID values as proposed in the paper were also based on the NIST and on experimental values performed by the PTB (Physikalisch Technische Bundesanstalt) of Germany.
25. It was agreed between Germany and CGA that close collaboration in comparing values would lead to mutually agreed upon data for inclusion in the final table.
26. The table to be proposed to the December meeting would still have some square brackets for certain filling ratios since this is a major task. It was also agreed that in case of discrepancy between the two sources, the more conservative filling ratio would be used. It is anticipated that almost all of these square brackets would be lifted before the December session. Should the work not be finalised, the table would contain blanks, automatically entailing the use of the very conservative formulae provided for in P 200 for gases with insufficient data.
27. The USA proposed the adoption of additional limiting factors for toxic gases in document 2000/51 which would reduce the pressure receptacle content according to the degree of toxicity of the gas.

Although this proposal was questioned by some members, it was agreed that CGA and Germany would factor this proposal into their work by systematically reducing the filling ratio.

28. The CGA agreed to incorporate additional filling ratios for high pressure liquefied gases to address pressure receptacles designed for test pressures other than those currently listed such as those used in North America.
29. The CGA agreed to cross check the  $LC_{50}$  values in the ISO 10298 and the DOT listing and agree on values to be included for the December session.
30. A number of special requirements were deemed redundant and deleted. Additional special requirements were added. EIGA proposed to put them into a logical order.
31. The USA will verify that the restrictions on the use of aluminium alloy cylinders as indicated by the special requirements based on ISO 11114-1 fit the current DOT restrictions.
32. Additional restrictions on the use of aluminium alloy pressure receptacles for oxygen were adopted.
33. It was agreed for toxic gases with an  $LC_{50} \leq 200 \text{ ml/m}^3$  cylinders would;
  - Be limited to a maximum water capacity of 85 litres
  - Have a minimum wall thickness of 3.5 mm for aluminium alloy or 2 mm for steel or otherwise be overpacked in a packaging meeting the PG I performance level.
34. The extension of the periodicity of testing LPG cylinders to fifteen years was made conditional on the agreement of the competent authority in the country of use.
35. A number of restrictions on the use of non refillable receptacles was adopted;
  - Flammable gases to be limited to a maximum water capacity of one litre;
  - Not allowed for toxic gases with an  $LC_{50} \leq 200 \text{ ml/m}^3$ ;
  - All should be overpacked;
  - No repairs are allowed after they have been taken into service.
36. It was agreed to group together all the requirements for acetylene, dissolved and solvent free. Likewise all special requirements of toxic gases would be grouped together.
37. The table would be split into three parts, one for compressed gases, one for liquefied and dissolved gases and a third one for liquids assigned to P 200. Additional elements to appear in the table are the primary and subsidiary hazards and the  $LC_{50}$  values. The provisions for liquids will have to be provided by the interested parties.

38. A significant number of editorial changes from Canada and other participants were adopted.
39. The requirements applicable to pressure receptacles which are not UN marked were revised to incorporate burst ratios more in line with pressure receptacles used in North America and other parts of the world. It was clarified that these receptacles would not bear the UN mark.

Proposals delegated by the Plenary Meeting

40. Proposal 2000/37 from Italy concerning refrigerant gases was accepted.
41. Inf. Paper No. 30 from Germany concerning acetylene, solvent free was accepted with minor amendments including limiting the copper content of valves to 65% and referral to the latest ISO standards 3807-1 and -2. The Secretariat is requested to allocate a UN number for acetylene, solvent free.

Conclusions

42. A lively debate about the way to proceed further lead to the compromise that a firm proposal would be presented to the December session for inclusion into the Orange Book. Proposal 1 on Definitions, Proposal 2 on Definitions and General Provisions and Proposal 5 for Part 5 were deemed to be final.
43. Proposal 3 on the Special Packing Provisions, Proposal 4 on Construction and Testing and Proposals 6 and 7 on MEGCs would have to be included with the proviso that they should not be considered for immediate adoption into modal and national regulations.

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