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

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LISTING, CLASSIFICATION AND PACKING

Classification as a consequence of Net Explosive Quantity (NEQ)

Transmitted by the Expert from Australia

SCOPE
This proposal aims to clarify issues raised in ST/SG/AC.10/C.3/2007/17 in respect of concerns relating to the behaviour of large NEQ of fireworks in a closed CTU.

RELATED DOCUMENTS
ST/SG/AC.10/C.3/2007/17 - (Australia)

Introduction

1. In document ST/SG/AC.10/C.3/2007/17 the Expert from Australia presented information in respect of a series of explosions occurred at a fireworks storage facility in Carmel, Western Australia on the 6th of March 2002. Some of the information used in ST/SG/AC.10/C.3/2007/17 taken from the official report was drawn from conflicting information. This conflict occurred as a result of reporting practices and statements made by the operators of the site and the inappropriate classification of some goods.

2. While this does not detract from the case being made by the expert form Australia, it was considered prudent to provide additional information on these issues in order to ensure the consideration of this issue remains focused on the primary area of concern and that is the behaviour of fireworks classified as having a ‘minor blast’, minor projection or ‘no significant’ hazard when carried in a closed transport unit.

Additional information on the Carmel incident

3. The Carmel incident was investigated by the Western Australian Department of Mineral and Petroleum Resources and can be downloaded from:
www.docep.wa.gov.au/resourcessafety/Sections/Dangerous_Goods/pdf/DG%20GMP/Explosives/The_Carmel_Explosion.pdf

4. Table 1 of ST/SG/AC.10/C.3/2007/17 used the information provided by the operator of the site to list the goods apparently stored in each of the magazines. While it was recognized that this

issue was a matter of conjecture as it appears that many of the fireworks stored in the magazines at Carmel were wrongly classified and consistently labelled one hazard division below the real risk as a result of the high amount of flash composition in those fireworks. This information was ascertained after the Carmel report was published and will not appear on the link given above.

5. If default classification table contained in section 2.1.3.5.5 of the UN model regulations had been appropriately applied to the fireworks in FC4 (noting the operator declared none) and magazine M3 it appears these should have been 1.1G. This is consistent with the behaviour of the fire and explosions in all magazines/containers except for the magazine M2.

6. Australia supports use of the UN default classifications but has reservations in respect to large volumes of division 1.3 and 1.4 in closed CTU's, which is the issue at hand. Magazine M2, which contained division 1.3G (and reportedly division 1.4G) fireworks, deflagrated. As noted in ST/SG/AC.10/C.3/2007/17 the roof and both doors were thrown a significant distance (roof of 1616kg thrown 21.7m, front and rear doors of 230kg thrown 7.4m and 50.5m respectively) by the explosion. However, evidence indicates that the walls were still standing after the explosion and were displaced by the very large detonation of M3. The estimated minimum NEQ contained in magazine M3 should be 941 kg, despite the 300kg declared by the site operator as reproduced in table 1 of ST/SG/AC.10/C.3/2007/17.

7. The deflagration of M2 was a low-level mass explosion that was not consistent with the overall default classification the contents of this magazine as 1.3 G fireworks.

8. In the Western Australian Department of Mineral and Petroleum Resources report (see link above) the investigators determined, through an estimation of blast damage (Appendix 16 of the report), and through witness recollections (appendix 3 of the report), that the actual NEQ in magazine M3 and FC4 was higher than the contents declared by the site operator (Chapter 4.1 of the report). However the declared and estimated NEQ for magazine M2 remains in the order of 725kg.

9. The expert from Australia believes that M2 deflagration represents general phenomena found with most, or many division 1.3 explosives, that they mass explode when packed together above a certain threshold amount. This threshold has not been established with certainty but the Australian expert believes that the Carmel experience supports a 1000 kg threshold.

10. It is worth noting that the deflagration of M2 appears to relate to the division 1.3G goods only, as the division 1.4G in magazine M1 burned out without a mass explosion. However, this observation may not be valid for all division 1.4 fireworks or other explosives and needs further examination. In addition, while the Australian expert considers the UN default classification is reasonably effective in respect of classification, there is a real likelihood that Division 1.4 fireworks are inappropriately classified, so a more cautious approach may be warranted.

Summary

11. As indicated in section 9 above, the deflagration of M2 represents general phenomena found with division 1.3 explosives, that is, they mass explode when packed together above a certain threshold amount. Certainly work done by the CHAF project (Quantification and Control of the Hazards Associated with the Transport and Bulk Storage of Fireworks) appears to support the view that division 1.3 can have a significant explosive potential when initiated in a closed CTU with a high NEQ. The Australian expert believes that the Carmel experience supports a 1000 kg threshold and seeks the view of others on this issue as indicated in ST/SG/AC.10/C.3/2007/17.

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