UN/SCETDG/31/INF.38

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-first session
Geneva, 2-6 July 2007
Item 11 of the provisional agenda

OTHER BUSINESS

Application for consultative status by the European Fireworks Association (EUFIAS)

Note by the secretariat

1. As indicated in the provisional agenda, the secretariat has received an application for consultative status from EUFIAS.

2. Information on this association may be found on **www.eufias.org**

3. The secretariat has received the attached proposals from EUFIAS for consideration in future if consultative status is granted.

PROPOSALS OF AMENDMENTS TO THE RECOMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Model Regulations on the Transport of dangerous Goods
Note 2 to 2.1.3.5.5 Firework Classification
Transmitted by the European Firework Association (EUFIAS)

Introduction

1. The European Fireworks Industry (EUFIAS) recognises the need for accurate assessment of the hazards posed by the transport of fireworks and also recognises the particular need to identify packaged fireworks which pose a potential mass explosion hazard (1.1G – UN 0333).
2. However, EUFIAS believes that the definition proposed to be adopted in Note 2 to 2.1.3.5.5 is not justifiable on either scientific grounds, nor on the basis of improving the safety of the transportation of fireworks under a default classification regime.
3. Furthermore, EUFIAS acknowledges that the default classification regime, agreed previously, which recognises the diversity of firework products means that carrying out of testing on all items or combinations of items within a package presented for transport is not practical. The UN default classification scheme for fireworks developed in 2002 and subsequently amended recognises that testing of every firework is not possible. (see for example ST/SG/AC.10/C.3/2002/1). The default sets relatively pessimistic criteria to enable assigning of a default classification without tests. EUFIAS believes that requiring new tests, which at present have not been adequately validated, potentially renders the concept of a "default" meaningless and can only lead to the process of classification falling into disrepute. EUFIAS believes that by so doing, there are increased risks to transporters users and the public.

Issues

4. The current, proposed definition of "flash powder", increasing the "cut-off" value to 8ms (from the 4ms proposed by the laboratory developing the tests) and extending the definition of "flash powder" to include "lifting charges" extends the scope of Note 2 far beyond its original intention with little scientific justification for so doing.
5. The definition to be adopted relies on tests that are still in the early stages of development as detailed in UN/SCETDG/30/INF.52. These tests have been the subject of much discussion, formally and informally, which call into question
   a) The reproducibility of the tests (UN/SCETDG/30/INF.3 details exceptionally large standard deviations and this is from testing using one test rig done by a single test laboratory, reproducibility among different rigs and different laboratories is likely to give even larger standard deviations.
   b) The large variation in the test results
   c) The lack of peer review of the tests methods or procedures

   We agree with the proposal in UN/SCETDG/30/INF.60 calling for a thorough investigation before adopting UN 2(c)(i)
6. EUFIAS does not believe that any relationship between t/p testing and the assignment of classification for transport has been made. The behaviour of 0.5g of material in a t/p test is not indicative of the behaviour of such material when placed in a firework article, nor of that article as presented for transport.

7. Further papers that have cited the Enschede and Kolding explosions and the CHAF research project, for example, have attempted to draw parallels between the effects of confinement in bulk storage, the UN Series 6 tests which are used for classification, and hence to the use of "flash powders" in fireworks. Such extrapolation is not valid, and the Working Group on the Transport of Dangerous Goods should not be influenced by this erroneous extrapolation into matters of storage which are not of their concern.

Recommendations

8. We urge the Working party to reconsider their adoption of the proposed text until the tests methods have been fully developed and test procedures agreed and fully documented and return to the original submission, knowing that a safety net exists in 2.1.3.5.2 in that the default can only be used "with the agreement of the competent authority". The documentation must include the following aspects
   a. The test method in detail
   b. The number of tests to be performed
   c. The interpretation of the results
   d. The grouping of products and/or compositions to determine when testing or restesting is necessary
   e. Agreement to mutually recognise tests results and subsequent classifications awarded by Competent Authorities
9. We have also proposed (see separate paper) a combined approach to the definition of "flash powder" which incorporates both descriptive definitions and t/p testing (when the latter is established). We urge the Working Group to adopt this approach to facilitate the adoption of practical test regimes to identify fireworks which pose a mass explosion hazard (1.1G – 0333) as presented for transport whilst excluding those for which there is no evidence of such a hazard.

PROPOSALS OF AMENDMENTS TO THE RECOMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS

Model Regulations on the Transport of dangerous Goods
Note 2 to 2.1.3.5.5 Firework Classification
Transmitted by the European Firework Association (EUFIAS)

Introduction

1. The European Fireworks Association (EUFIAS) have presented a separate paper (???) on their concerns with the proposed amendments to Note 2 of 2.1.3.5.5 Fireworks Classification default table.
2. This paper outlines an approach to the definition of "flash powder" which EUFIAS believes will achieve the following:-
   a. Provide a consistent approach to determining if certain compositions, in the form and for particular purposes should be considered as "flash powder"
   b. Simplify the proposed process of identifying "flash powder" in a manner which can be consistently applied by users and regulators
   c. Reduce the potential for novel compositions to achieve incorrect assignment
   d. Reduce the need for testing in line with the aims of the original default proposal

Issues

3. There is, at present, no agreed protocol for testing firework compositions to determine if they constitute "flash powder". Without such a protocol, and while the tests themselves are still under development, neither industry or enforcers can easily determine if the products being classified have components which might necessitate a 1.1G (UN 0333) hazard being awarded.
4. EUFIAS is aware that various Competent Authorities and test laboratories are already proposing wildly differing tests regimes to identify such components. For instance, for a range of firework shells of the same calibre but differing only in colour effect there is no consensus if
   a. Different colour shells need retesting (even if the amount of bursting charge remains the same)
   b. Whether this needs to be done on a "batch testing" or "type testing" style regime
5. Furthermore there is no current consensus on
   a. How to account for variations in samples
   b. The test method in detail
   c. The number of tests to be performed
   d. The interpretation of the results
   e. Agreement to mutually recognise tests results and subsequent classifications awarded by Competent Authorities
6. EUFIAS believes that a "traffic light" type system would be greatly beneficial in resolving many of these aspects. In essence this system would identify
   a. Those compositions, in the form and manner of their use, that should always be considered as "flash powder" and therefore should not be subject to repeated testing – the RED compositions

b. Those compositions, in the form and manner of their use, which should not be considered as “flash powder” and therefore should not be subject to repeated testing – the GREEN compositions

c. A range of compositions (known and unknown) which have properties which do not allow assignment into either the 2 previous categories, or that differ depending on usage, or that require further investigation prior to assignment to one of the previous 2 categories – the ORANGE compositions

7. It is important to recognise that over time, the number of compositions/usages in the ORANGE category would diminish providing the criteria for inclusion as “flash powder” remains the same. If the criteria change, then a readjustment of assignment of RED/ORANGE/GREEN category would be needed (and would be relatively simple to achieve) together with further testing.

8. The assignment of compositions to the categories would be dependent on the following features of the compositions

a. The basic chemical composition
b. The presence of certain chemical components or lack of them
c. The ratio of components
d. The particle sizes of the components
e. The intended application of the composition (eg as effect, as a bursting charge or as a lifting charge)

9. The following table is intended to be indicative only – the ranking of the compositions has been done following consultation with experts, however it is not complete and does not correlate to t/p tests results at present. The ranking is done on a scale of 1-10, 1 being the most sensitive or energetic compositions. It is intended to be used for illustrative purposes only.

UN Default classification - composition components

Roles								
Burst	Effect	Lift	Oxidant	Fuels	Proportion	Other components	Notes	p/t	Rating
x	x	x	Any other oxidant	Any fuel	any	any or none			6
x	x	x	Any other oxidant	Any metal	any	any or none			4
x	x		Barium Nitrate	Aluminium (<=200 mesh)	any	any or none			5
x	x		Barium Nitrate	Aluminium (<=200 mesh)	any	sulphur or sulphides			4
x	x		Barium Nitrate	Aluminium (>200 mesh)	any	any or none			6
x	x		Barium Nitrate	Aluminium (>200 mesh)	any	sulphur or sulphides			5
x	x		Barium Nitrate	any other metal	any	any or none			7
x	x		Barium Nitrate	any other metal	any	sulphur or sulphides			6
x	x		Blackpowder	Aluminium	any	any or none	as BP components		5
x	x		Blackpowder	Aluminium (<=100 mesh)	any	any or none	as commercial BP		6
x	x		Blackpowder	Aluminium (<=200 mesh)	any	any or none	as commercial BP		4
x	x		Blackpowder	Aluminium (>80 mesh)	any	any or none	as commercial BP		7
x			Blackpowder	Any other metallic fuel	<=10% metal	any or none			7
x			Blackpowder	Any other metallic fuel	>10% metal	any or none			5
	x		Blackpowder	Any other metallic fuel	<=10% metal	any or none			8
	x		Blackpowder	Any other metallic fuel	>10% metal	any or none			6
x	x		Blackpowder	Titanium (<=25 mesh)	>20% Ti	any or none	as commercial BP		4
x	x		Blackpowder	Titanium (<=25 mesh)	<=20% Ti	any or none	as commercial BP		5
x	x		Blackpowder	Titanium (<=25 mesh)	>20% Ti	any or none	as BP components		5
x	x		Blackpowder	Titanium (<=25 mesh)	<=20% Ti	any or none	as BP components		6
x	x		Blackpowder	Titanium (>25 mesh)	>20% Ti	any or none	as commercial BP		5
x	x		Blackpowder	Titanium (>25 mesh)	<=20% Ti	any or none	as commercial BP		6
x	x		Blackpowder	Titanium (>25 mesh)	<=20% Ti	any or none	as BP components		7
x	x		Blackpowder	Titanium (>25 mesh)	>20% Ti	any or none	as BP components		7
x	x	x	Blackpowder			any or none	as commercial BP		7
x	x	x	Blackpowder		>60% oxidant	any or none	as BP components		7
x	x	x	Blackpowder		<=60% oxidant	any or none	as BP components		9
x	x	x	Potassium Chlorate	Any metal	any	any or none			1
x			Potassium Chlorate	Any non-metal fuel	any	any or none			5
	x		Potassium Chlorate	Any non-metal fuel	any	any or none	as loose powder		6
	x		Potassium Chlorate	Any non-metal fuel	any	any or none	as consolidated star		7
x	x		Potassium Chlorate	charcoal	any	any or none	as loose powder		3
x			Potassium Perchlorate	Aluminium (<=200 mesh)	any	any or none			4
	x		Potassium Perchlorate	Aluminium (<=200 mesh)	any	any or none	as consolidated star		7
x			Potassium Perchlorate	Aluminium (<=400 mesh)	any	any or none			2
	x		Potassium Perchlorate	Aluminium (<=400 mesh)	any	any or none	as consolidated star		6
x			Potassium Perchlorate	Aluminium (<=80 mesh)	any	any or none			5
	x		Potassium Perchlorate	Aluminium (<=80 mesh)	any	any or none	as consolidated star		7
x			Potassium Perchlorate	Aluminium (>80 mesh)	any	any or none			7
	x		Potassium Perchlorate	Aluminium (>80 mesh)	any	any or none	as consolidated star		8
x	x		Potassium Perchlorate	Any metal	any	antimony sulphide			5
x	x		Potassium Perchlorate	Any metal	any	sulphur			5
x	x		Potassium Perchlorate	Any metal	any	ammonium salts			6
x	x		Potassium Perchlorate	Any metal	any	Copper salts			6
x	x		Potassium Perchlorate	Any other fuel	any	any or none			3
x	x		Potassium Perchlorate	Any other metal	any	any or none			5
x	x		Potassium Perchlorate	charcoal	any	any or none	as loose powder		7

x		Potassium Perchlorate	Magnalium (<=100 mesh)	any	any or none		2
x	x	Potassium Perchlorate	Magnalium (<=100 mesh)	any	any or none		2
	x	Potassium Perchlorate	Magnalium (<=100 mesh)	any	any or none	as consolidated star	7
x		Potassium Perchlorate	Magnalium (>100 mesh)	any	any or none		5
x	x	Potassium Perchlorate	Magnalium (>100 mesh)	any	any or none		5
	x	Potassium Perchlorate	Magnalium (>100 mesh)	any	any or none	as consolidated star	7
x		Potassium Perchlorate	Magnesium (<=100 mesh)	any	any or none		5
	x	Potassium Perchlorate	Magnesium (<=100 mesh)	any	any or none	as consolidated star	7
x		Potassium Perchlorate	Magnesium (>100 mesh)	any	any or none		7
x	x	Potassium Perchlorate	Magnesium (>100 mesh)	any	any or none	as consolidated star	8
x	x	Potassium Perchlorate	Sodium Benzoate	any	any or none	as loose powder	3
	x	Potassium Perchlorate	Sodium Benzoate	any	any or none	as whistle unit etc	7
x	x	Potassium Perchlorate	Sodium Salicylate	any	any or none	as loose powder	3
	x	Potassium Perchlorate	Sodium Salicylate	any	any or none	as whistle unit etc	7
x	x	Potassium Perchlorate	Titanium (<=25 mesh)	any	any or none		5
x	x	Potassium Perchlorate	Titanium (<100 mesh)	any	any or none		4
x	x	Potassium Perchlorate	Titanium (<200 mesh)	any	any or none		3
x	x	Potassium Perchlorate	Titanium (>25 mesh)	any	any or none		8
x	x	Potassium Perchlorate	Zirconium	any	any or none		2

Notes

1 **Terms for roles as follows:-**

Burst - used as main charge to ignite stars/sub components and to break the case of, for instance, shell/rocket
Effect - aural or visual effect, or bursting charge of sub-component of, for instance, shell - eg shell with cracker units or mine units
Lift - used as charge to propel a unit/units from a tube (eg shell fired from mortar or Roman Candle lifting charge) or as motor (eg rocket)

2 **The relative explosivity of the various compositions is, at this stage, not related to p/t values**

3 **Mesh sizes are nominal**

4 **percentage values are nominal - may be subject to +/- 2% variation in individual samples**

5 **Ranges are given below**

1	4	***Subject to the "flash powder" requirements of the default classification***
5	6	***Intermediate - must be subject to p/t testing***
7	10	***Not considered "flash powder" for the requirements of the UN default classification***

Recommendations

10. The Working group endorse the principle of a “traffic light” system to complement the development of t/p testing for “flash powders”
11. The Working Group encourage mutually recognised research to refine and extend the scope of the illustrative table and to assigning compositions to the “traffic light” system

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