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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-third session
Geneva, 30 June-9 July (a.m.) 2008
Item 2 of the provisional agenda

EXPLOSIVES AND RELATED MATTERS

Definition of Phlegmatized

Transmitted by the expert from Australia*

Background

1. As outlined in informal document UN/SCTDG/32/INF.21, the requirements of the 15th revised edition of the UN Recommendations on the Transport of Dangerous Goods Model Regulations (UN15) were examined closely during work to update the Australian Explosive Code (AEC). It was noted that the terms “phlegmatize”, “phlegmatized” and “phlegmatizer” are not in common use, nor are they included in Standard English language dictionaries. However, the terms “phlegmatized” and “phlegmatizer” are used in UN15 in a number of locations in respect of Class 1 goods, specifically:

* In accordance with the programme of work of the Sub-Committee for 2007-2008 approved by the Committee at its third session (refer to ST/SG/AC.10/C.3/60 para. 100 and ST/SG/AC.10/C.3/34, para. 14).

Phlegmatizer:	Section 3.1.1.4 Section 4.1.1.7 Packing Instruction P406, additional requirement 1 PSN for UN0075, UN0143, UN0150 and UN0391 (DGL and index) Special Provision 266 Special Provision 271
Phlegmatized:	Section 4.1.4.8 Special Provision 131 Special Provision 227

2. Within the Proper Shipping Names (PSN) for UN0075, UN0143, UN0150 and UN0391 “phlegmatizer” is used in two ways to describe the means of desensitising particular substances. For UN0075 and UN0143 the product is desensitised with a non-volatile water-insoluble “phlegmatizer”, while UN0150 and UN0391 are simply desensitised by a “phlegmatizer” with no reference to volatility or solubility.

3. The lack of a commonly accepted definition for the terms “phlegmatized” or “phlegmatizer” in the UN Model Regulations increases the potential for inconsistent interpretation.

4. The expert from Australia interprets the term “phlegmatized” to apply to an explosive that has had an agent or “phlegmatizer” added to stabilize or desensitize the explosive. This interpretation has been subsequently reinforced by references provided by members of the Sub-Committee. For the UN numbers identified above, this is desirable to enable the safe handling and transport of these goods in the packages prescribed in the dangerous goods list. The purpose of the “phlegmatizer” is to act as a barrier between molecules of the explosive to slow down the heat transfer and any resultant reaction, and reduce impact and friction sensitivity. As noted in *Explosives* (Mayer et al)¹ the impact and friction sensitivity of sensitive crystalline explosives can be altered by the addition of small amounts of “phlegmatizer”. The *Encyclopaedia of Explosives* (Fedoroff and Sheffield)² gives definitions in broader terms, namely:

Desensitisation (or Phlegmatization) of an explosive, means rendering it insensitive or less sensitive to the following actions: heat, shock, impact, percussion, rifle bullet or friction.

Desensitiser (or Phlegmatizer) is a substance which makes insensitive or reduces the sensitivity of an explosive.

¹ Page 255, Rudolph Mayer, Josef Kohler and Axel Homburg – *Explosives*, fifth completely revised edition – Wiley-VCH

² Page D88, Basil T. Fedoroff and Oliver E. Sheffield (1966) – *Encyclopaedia of Explosives and related items*, PATR 2700, volume 3 – Picatinny arsenal, Dover New Jersey USA.

Typical “phlegmatizing” agents include wax, paper, water, and alcohol, oils such as petroleum jelly and paraffin, as well as particular polymeric materials.

5. The “phlegmatizing” of materials is not limited to UN0075, UN0143, UN0150 and UN0391, with many sensitive explosives incorporating a “phlegmatized” material; e.g. dynamite can be considered a “phlegmatized” form of nitro-glycerine. In some cases the “phlegmatizer”, or a “phlegmatized” explosive, may include a dye to distinguish the desensitised product from its more sensitive explosive form.

Proposal

6. It is proposed that a definition for “phlegmatized” be inserted into chapter 1.2 which reads:

“phlegmatized” means the addition of a substance (or “phlegmatizer”) to an explosive to facilitate its safe handling and transport. The phlegmatizer renders the explosive insensitive, or less sensitive, to the following actions: heat, shock, impact, percussion or friction. Typical phlegmatizing agents include wax, paper, water, polymers (such as chlorofluoropolymers), alcohol and oils (such as petroleum jelly and paraffin).
