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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
(Twenty-fourth session, 1-10 December 2003,
agenda item 7 (c))

HARMONIZATION WITH THE GLOBALLY HARMONIZED SYSTEM OF
CLASSIFICATION AND LABELLING OF CHEMICALS (GHS)

Physical hazards

Harmonized classification criteria for flammable liquids

Transmitted by the expert from the United States of America

1. During the 23rd session of the Sub-Committee, it was agreed that the Model Regulations should be harmonized with the Globally Harmonized System for the Classification and Labelling of Chemicals (GHS) physical hazard criteria during the 2003-2004 biennium. The GHS includes a category (category 4) for flammable liquids that are not currently covered in the Model Regulations. The expert from the United States of America is of the opinion that in developing internationally harmonized criteria for flammable liquids consistent with the GHS, and in order to enhance safety, the levels of flammability in the Model Regulations should be harmonized with those in the GHS. It is proposed that liquids with a flash point of 93 °C and below when transported in quantities exceeding 450 liters (bulk quantities) be considered as flammable liquids. These flammable liquids are considered to pose a risk in transport that justifies their inclusion in the Model Regulations. Packages of flammable liquids in this category of flashpoint ranges would not be subject to the model regulations when transported in packaging of a volume less than 450 liters and the current exceptions such as those for viscous liquids and liquids that are not capable of sustaining combustion would still apply. This paper is also proposing to replace the value of 60.5 °C with 60 °C consistent with the GHS.

Discussion

2. The GHS flammability criterion is already in use in the case of transport and workplace safety regulations in the United States and workplace safety requirements in Canada. It is further noted that a number of European countries also use a comparable criterion for supply or workplace safety purposes. Substances with flash points in the range of 60.5 °C to 93 °C have contributed to or caused fires, deaths, injuries and major property losses. In several transport accidents that have occurred large volumes of such liquids is spilled and ignited upon contact with a hot surfaces. Under such conditions, fuel oil, a common substance typically having a flash point in this range, can be more dangerous than many liquids that are presently classified as flammable liquids under the UN criteria due to their low autoignition temperature and high energy release per unit volume especially when transported in volumes greater than 450 liters per package.

3. United States Department of Transportation (U.S. DOT) accident data supports the need to regulate liquids with a flash point greater than 60.5 °C and less than or equal to 93 °C. In one incident involving a road tank vehicle carrying fuel oil with a flash point greater than 60.5 °C and a train, 13 people were killed due to burns and smoke inhalation. The data further indicates that approximately 80 transport incidents involving spillage of liquids in this flash point range occur annually. Of these incidents an average of one per year results in a fire. Over a five year period even with these substances regulated as dangerous goods, such incidents resulted in 15 injuries and 3 deaths. We are also aware of accidents involving these flammable liquids in international commerce including an accident involving a passenger bus and a fuel oil truck involving approximately 12 fatalities.

4. Table 1 illustrates the level of risk posed by groups of substances in the various flash point ranges in the workplace. The table presents the United States experience with structure fires in which flammable or "combustible liquids" were the initial fuel. Substances in the 60.5 °C to 93 °C flash point range are shown to be responsible for higher property losses than several categories of flammable liquids.

TABLE 1

U.S. Structure Fires with Flammable or combustible Liquids as the Type of material First Ignited, Arranged by Type of Liquid, and Ranked by Direct Property Damage.

Flammable or combustible liquid	Annual Average 1989 - 1993.			
	Fires	Civilian deaths	Civilian injuries	Direct property damage
Class IA Flammable Liquid (FP<22.8°) (BP<37.8°)	1,510	34	178	\$327,710,800
Gasoline	13,800	180	1,250	\$246,554,600
Flammable or Combustible Liquid Unclassified	6,710	105	435	\$196,246,900
Class II Combustible Liquid (37.8°C<FP<60.5 °C)	7,300	84	288	\$75,820,500
Class IIIA Combustible Liquid (60.5 °C≤FP≤93.3 °C)	1,010	4	23	\$56,076,300
Class IB Flammable Liquid excluding gasoline (FP<22.8 °C)	1,230	8	166	\$30,564,700
Class IC Flammable Liquid (22.8 °C≤FP≤37.8 °C)	1,180	11	157	\$16,507,800
Total	32,820	425	2,496	\$949,481,700

8. On the basis that ignition of these liquids is possible in an accident situation, emergency services personnel in the United States are trained to deal with "combustible" liquids in this flash point range in the same manner as flammable liquids and proper identification is necessary in order to communicate this hazard in the event of an incident. Also Canada and the United States now require Material Safety Data sheets and labelling for these materials to inform employers and employees of the hazards of handling and storing these materials as it relates to workplace safety. International harmonization and safety will be greatly enhanced by adding this additional flash point range to the ranges of flammability drawn from the UN Recommendations.

Proposal

9. Prior to making a formal proposal it is requested that the Sub-Committee take a decision in principle whether the Model regulations should be harmonized with the GHS with respect to expanding the PG III criteria for flammable liquids. We envision that the following proposals would be necessary. We understand that the proposals will need to be further elaborated in order to comprehensively address the amendments that would be necessary to accomplish the harmonization objective.

Paragraph 2.3.2.6 would need to be amended by replacing the upper flash point cut-off for PG III of 60.5 °C with 93 °C and paragraph 2.3.2.4 would need to be amended by adding the following:

Substances that meet the criteria for PG III that have a flash point greater than 60 °C are not subject to these Model Regulations when transported in packagings of less than 450 litres.