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Sub-Committee of Experts on the Transport of Dangerous Goods
(Eighteenth session,
Geneva, 3-12 July l999,
agenda item 5(a), (d))

Comments on ST/SG/AC.10/C.3/2000/12

Classification of Air Bags

Transmitted by the Expert from the United States

1. The expert from the United States has reviewed the proposal to revise the criteria for classification of air bag inflators, air bag modules and sea-belt pretensioners in ST/SG/AC.10/C.3/2000/12 and supports the principles that:

- classification of air bags should be on the basis of the hazard that they pose in transport;
- the UN provisions should be flexible so that they take into account the development of new airbag designs without having to introduce a new shipping name each time a new design is developed; and
- the classification procedure should be simple.

However, the current provisions in the UN Model Regulation largely satisfy these principles and the proposal as drafted does not appear to provide additional benefit. The expert from the United States would also add that if any modifications are made to the requirements for these devices, these revisions should also acknowledge the safe transport history of these articles. Many millions of air bag inflators, air bag modules and sea-belt pretensioners have been transported safely and effectively in and out of the United States.

Hereafter, the term air bag should be taken to mean air bag inflators, air bag modules and sea-belt pretensioners.

2. The expert from the Unites States understands that the proposal in ST/SG/AC.10/C.3/2000/12 would:

.1 classify all air bags with more than 2 grams of explosive substance without testing as items of Division 1.4G;

Note - The term explosive substance is taken to be defined as in 2.1.1.3(a) which includes pyrotechnic substances.

.2 classify air bags with less than 2 grams of pyrotechnic substances as items of Class 9 without testing;

Note - The term pyrotechnic substance is taken to be defined as in 2.1.1.3(b).

.3 classify air bags with 2 or more grams of pyrotechnic material as items of Class 9 if they may be excluded on the basis of 2.1.1.1 (b) and 16.6.1.4.7(a)(ii) and analysis shows that when

packaged for transport there will be no fragmentation of any pressure vessel or projection hazard when they are engulfed in a fire; and

.4 classify air bags under class 9 consistent with the existing criteria for passing the bonfire test and in addition subject to the devices meeting the criteria for classification as 1.4S.

Comments

3. The expert from the United States has three major concerns associated with assigning air bags containing more than 2 grams of explosives to 1.4G. Namely:

.1 it will not reduce testing. Given that pyrotechnic substances are explosive substances and based on information from industry representatives that most foreseeable air bag designs will incorporate 2 or more grams of explosive substances, most new air bag designs that have not been tested would be assigned to 1.4G. To avoid the transport constraints applying to 1.4G explosives, manufacturers would be compelled to test their designs to demonstrate that they merit Class 9 classification.

.2 classification of explosives is done on the basis of performance criteria. Classifying air bags as 1.4G explosives without their posing the risk of 1.4G has the potential for unnecessarily complicating emergency response efforts in the event of an incident.

.3 in the case of air bags which should be assigned a more severe classification than 1.4G, a degree of risk less than that actually present will be communicated.

4. In general, regardless of the gas generating mechanism employed, all air bags pose the same type of hazard in transport. Namely, inadvertent actuation, possibly through a fire condition, could result in their inflating and being thrown some distance or fragmentation of some portion of the device. This behavior is not directly related to the quantity of explosive or pyrotechnic material present. Therefore, the expert from the United States questions the value of varying the classification or testing on the basis of explosive or pyrotechnic substance composition. The current UN requirements ensure, through the conduct of the bonfire test, that all air bags, independent of composition, will either through design of the air bag or through packaging not significantly hinder fire fighting or other emergency response efforts in the immediate vicinity in the event of a fire. This level of safety is reduced through the proposed revisions in that some types of air bags will no longer require testing. The authors have not demonstrated that these types of air bags warrant this testing exception.

5. The 2.1.1.1(b) criterion for accepting air bags with more than 2 grams of pyrotechnic substance into class 9 currently only applies to air bags that may be classified under Division 2.2. The 2.1.1.1(b) criterion is very stringent and other types of air bags will not likely be classified as class 9 on the basis of this criterion. Applying this provision to other types of air bag introduces confusion in that under the proposal, air bags with more than 2 grams of pyrotechnic material may be classified as items of class 9 on the basis of two different sets of criteria (i.e.; the criteria described in 2.3 or 2.4 above). To add to the confusion, the acceptance criteria for each of these provisions are different.

6. The proposal (i.e.; as in 2.4 above) introduces the additional condition of air bags meeting the criteria of 1.4S whereas these air bags are currently assigned to Class 9 on the basis of a bonfire test. It is not clear what the authors intended with the introduction of this new condition. However, if any difference

from the existing requirements was intended, this could have a significant impact on air bags already tested and would need to be thoroughly justified.
