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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 4 (c))

PACKAGINGS

**Resistance to stacking of composite Intermediate Bulk Containers (IBCs)
with metal outer framework and plastic inner receptacle with dissimilar bases**

Transmitted by the expert from Australia

SCOPE

This proposal aims to recommend:

- i. Amendments to Chapter 7.1 with the addition of a provision relating to the safe stacking of Composite Intermediate Bulk Containers:
- ii. Amendments to IBC Special provision to refer to item (i);
- iii. Amendments to define "Transport Units".

RELATED DOCUMENTS

UN/SCETDG/23/INF.23 (Australia) Approval of Intermediate Bulk Containers

Background

During the 23rd session the Australian expert presented INF.23 relating to difficulties experienced with the stacking of composite Intermediate Bulk Containers (IBCs) with pallet bases of dissimilar designs. The relevant portions of the text of the UN/SCETDG/23/INF.23 is provided as an attachment to this paper. Originally the Australian expert proposed that the approval scope for IBC under section 6.5.1.1 be amended to require the stacking compatibility of IBCs to be subject to Competent Authority approval. It was suggested it would be appropriate that where an IBC can only be stacked with another unit of the same type, unless another load bearing device is used between the IBCs, that this should be stipulated in the approval and marked on the IBC.

This approach was rejected by the committee on the basis that it did not appear that the problems concerning non-authorized stacking of IBCs noted in INF.23 could be settled by additional particulars in the approval certificates or additional markings which were not likely to be any better observed in practice. It was suggested however that the best solution would rather be a better application of guidelines for the loading and stowage of goods in containers or vehicles (e.g. IMO/ILO/UNECE guidelines) and that these guidelines could be better promoted, for example, by including parts of them in the United Nations Recommendations in some form or other.

Proposals

It is requested the committee consider the following recommendations for changes to the Model Regulations in order to address the issue identified in INF.23 and subsequent re-examination.

Recommendation 1.

In line with the suggestions of the Committee it is recommended that an amendment be made to chapter 7.1 in order to promote the application of guidelines and require due care to be taken with the stacking of composite IBCs into Cargo Transport Units (CTU). It is proposed that a new provision be included under section 7.1.1 (Application and General Provisions) as 7.1.1.6 with wording to the effect that:

“The stowage and stacking of IBCs within a Transport Unit should be consistent with the recommendations of the IMO/ILO/UN ECE Guidelines for Packing of Cargo Transport Units (CTUs) as contained in the supplement to the International Maritime Dangerous Goods (IMDG) Code. Composite IBCs with dissimilar pallet base design should not be stacked together unless the lower IBC can properly support that stacked above it or a load bearing device is placed between the IBCs”.

Recommendation 2.

In order to ensure that the requirements detailed in recommendation 1 are applied it is further recommended that special packing provisions contained within the packing instructions for IBCs be amended with the addition of the words:

“Noting 7.1.1.6”

at the end of the current text of special packing provisions B1 and B2.

Recommendation 3.

It is noted that while the Model regulations do not define a ‘Transport Unit’ or ‘Closed Transport Unit’ within section 1.2.1 this term is used in the special packing provisions B1 and B2 as indicated above. It is recommended the definitions of ‘CTU’ and a modified version of ‘Closed CTU’, as contained within the IMDG code, are incorporated in section 1.2.1 to address this issue. Wording of definitions would be:

Transport Unit; means a road freight vehicle, a railway freight wagon, a freight wagon, a freight container, a road tank vehicle, a railway tank wagon or a portable tank.

Closed Transport Unit; means a transport unit which totally encloses the contents by permanent structures. Transport Units with fabric sides or tops are not closed transport units.

Whether or not the term “Cargo Transport Unit (CTU)” should be substituted for “Transport Unit” to ensure modal consistency should also be considered but does not appear to be a critical issue.

Attachment 1

Introduction

The current trend in the manufacture of Intermediate Bulk Containers (IBCs) has seen a progressive move to “lightweight” composite Intermediate bulk containers (plastic inner receptacle and metal outer framework of types 11HZ1, 21HZ1 and 31HZ1) for the transport of liquid, and some dry dangerous goods, when carried in a Cargo Transport Unit (CTU). In an effort to minimise bulk, weight and cost; the metal outer frame structure is often limited to the minimum required to surround the inner receptacle and support another IBC stacked above it.

Issues

While the design practices used to produce a “lightweight IBC” are often similar it is not common for the pallet or support arrangements for stacking of IBC to be the same. As such, many lightweight IBCs are often not suitable for stacking with other IBCs except those of the same design. This is due to the nature of the pallet and the design of the support arrangements of the upper surface of the IBCs. This is not an issue for an IBC where the design of the top of the IBC is such that it can support any design of pallet, however, these tend to be older or ‘heavyweight’ designs.

Where a shipment within a CTU consists solely of lightweight IBCs of the same design there is generally no risk. However, in shipments within a CTU where a variety of design types are used as well as mixes of heavyweight and lightweight designs the experience in Australia is that the potential for failure of the outer casing (framework) of the lightweight IBCs and subsequent damage of the inner receptacle is significantly increased. The damage generally occurs due to:

- i. the upper IBC ‘falling into’ the IBC on which it is stacked (see picture below); or
- ii. the IBC falling within the CTU or out of the CTU when opened for discharge due to the stack being less stable as a result of limited contact between the pallet of the upper IBC and the IBC on which it is stacked.

These scenarios have been the cause of a number of spillages of dangerous goods and are considered a potential hazard for both land and sea transport operations and it appears that the use of lightweight IBCs in such circumstances is contrary to the requirements of section 4.1.1.1 and needs to be resolved.



Damage to corner of IBC (inside undamaged outer package corner) stemming from upper pallet base coming into contact with rigid plastic inner package.



Compressive damage has occurred despite cross rails and frames being undamaged. This IBC has been certified as a reusable IBC without restriction.



Light weight IBC with minimum outer packaging, particularly on the upper surface, and specially designed pallet base
