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WORKING PAPER

DANGEROUS GOODS PANEL (DGP)
MEETING OF THE WORKING GROUP OF THE WHOLE

Abu Dhabi, United Arab Emirates, 7 to 11 November 2010

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2013/2014 Edition

Agenda Item 2.1: Part 1 — General

PROPOSAL TO PROVIDE A DEFINITION FOR "STRONG OUTER PACKAGING"

(Presented by A. Tušek)

SUMMARY

This paper proposes the introduction of a definition for "strong outer packaging", as this expression is used but not defined in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) and leaves the term open to interpretation.

The paper is presented as a means for establishing a minimum level of performance for dangerous goods requiring "strong outer packaging" and invites the working group to consider adopting the proposed definition presented in the appendix to this working paper.

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 I am often asked by industry to define for them my opinion of what would be accepted as "strong outer packaging" when the term is used without guidance in the Technical Instructions.

1.2 A number of references to "strong outer packagings" provide some insight into what is meant by the term.

1.3 Special Provision A41, sub-paragraph e) (applicable to permeation devices) includes a reference to strong outer packaging and outlines what is basically a performance test for strong outer packaging as follows:

. . .

e) The secondary packaging must be securely packed in strong outer packaging. The completed package must be capable of withstanding, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:

i) the following free drops onto a rigid, non-resilient, flat and horizontal surface from a height of 1.8 m:

— one drop flat on the bottom;
— one drop flat on the top;
— one drop flat on the long side;
— one drop flat on the short side;
— one drop on a corner at the junction of three intersecting edges; and

ii) a force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the test sample).

Note.— Each of the above tests may be performed on different but identical packages.

1.4 Packing Instructions 965 to 970 for lithium batteries also have a requirement for strong outer packaging and refer to 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1), extracted below:

4;1.1:

1.1.1 Dangerous goods must be packed in good quality packagings, which must be strong enough to withstand the shocks and loadings normally encountered during transport, including removal from a pallet, unit load device or overpack for subsequent manual or mechanical handling. Packagings must be constructed and closed so as to prevent any loss of contents when prepared for transport, which may be caused under normal conditions of transport, by vibration, or by changes in temperature, humidity or pressure (resulting from altitude, for example). Packagings (including inner packagings and receptacles) must be closed in accordance with the information provided by the manufacturer. No dangerous residue must adhere to the outside of packages during transport. These provisions apply, as appropriate, to new, reused, reconditioned or re-manufactured packagings.

Note.— The nature of transport dictates that many packages are likely to be moved between different modes of transport with the attendant increase in handling, e.g. from vehicles into warehouses and then onto aircraft. Additionally, packages consigned on a pallet may be removed from that pallet to assist handling and loading which may be carried out manually. To avoid damage and leakage from packages during transport, shippers should take this into account in selecting an appropriate packaging or in making the decision about the suitability of an already packaged item. In this respect, it is recommended that single steel or aluminium packagings (1A1, 1A2, 1B1, 1B2, 3A1, 3A2, 3B1, 3B2), when transported in narrow-bodied aircraft and not otherwise protected by, for example, placement in a unit load device, be provided additional protection against the abrasive effects experienced in loading the aircraft through overpacking, palletization or other means of protecting the bottom head and chime. Also, small single packagings, with a capacity of 2 L or less, should be overpacked to facilitate handling and to permit adequate securing of the dangerous goods aboard the aircraft.

4;1.1.3.1:

1.1.3.1 Parts of packagings which are in direct contact with dangerous goods:

a) must not be affected or significantly weakened by those dangerous goods;

b) must not cause a dangerous effect, e.g. catalyzing a reaction or reacting with the dangerous goods; and

c) must not allow permeation of the dangerous goods that could constitute a danger under normal conditions of transport.

Where necessary, they must be provided with a suitable inner coating or treatment.

4; 1.1.10:

1.1.10 Inner packagings must be so packed, secured or cushioned in an outer packaging in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into

> the outer packaging. Inner packagings containing liquids must be packaged with their closures upward and placed within outer packagings consistent with the orientation markings prescribed in 5;3.2.11 b) of these Instructions. Inner packagings that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastic material, must be secured in outer packagings with suitable cushioning material. Any leakage of the contents must not substantially impair the protective properties of the cushioning material or of the outer packaging.

1.5 Therefore, having regard to the above, a strong outer package meeting the areas outlined would be regarded as meeting the intention of the expression “strong outer packaging”.

1.6 The term “strong outer packaging” might also provide a starting point for a minimum level of outer packaging acceptable for the air transport of items regarded as “not restricted”.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to consider adopting the proposed definition presented in the appendix to this working paper.

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APPENDIX

PROPOSED AMENDMENT TO THE TECHNICAL INSTRUCTIONS

Part 1

GENERAL

. . .

Chapter 3

GENERAL INFORMATION

Parts of this Chapter are affected by State Variation BE 1; see Table A-1

3.1 DEFINITIONS

. . .

Strong Outer Packaging. An outer packaging that conforms to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.10) and where the completed package must be capable of withstanding, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:

a) the following free drops onto a rigid, non-resilient, flat and horizontal surface from a height of 1.8 m:

i) one drop flat on the bottom;

ii) one drop flat on the top;

iii) one drop flat on the long side;

iv) one drop flat on the short side;

v) one drop on a corner at the junction of three intersecting edges; and

b) a force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the test sample).

Note.— Each of the above tests may be performed on different but identical packages.

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