

DANGEROUS GOODS PANEL (DGP)

NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

Agenda Item 3: Resolution, where possible, of the non-recurrent work items identified by the Commission or the panel

3.1: Principles governing the transport of dangerous goods on cargo only aircraft

REFORMATTING OF PACKING INSTRUCTIONS - COMPATIBILITY

(Presented by D. Raadgers)

1. BACKGROUND

1.1 The first version of the proposed modifications was presented by the working group on Packing Instructions at DGP-WG02. At this meeting, several comments were received and it was agreed there should be further discussion on the subject of compatibility. A proposal to develop for additional text regarding compatibility, as presented by the Netherlands in DGP-WG03-WP/56, was agreed. This working paper provides such a proposal.

2. INTRODUCTION

2.1 Packing Instructions for classes 3, 4 and 5 have existed for years; however the historical basis for this detailed division is unknown. In many cases it appears that the detailed division was based on the then existing state of knowledge of the compatibility of the chemicals with the Packing Instructions, so that in the present Packing Instructions the compatibility of packaging is an important part of the detailed division. Also the compatibility is still a very actual and relevant safety item.

2.2 In the proposed amendments by the working group on Packing Instructions, it is proposed to include the requirements of compatibility only in the general requirements of the Packing Instructions of the classes involved. Also, the whole requirements are laid down as being the shipper's responsibilities.

2.3 The National Testing Authority of Packaging in the Netherlands has examined this part of the proposals and said that they are a strong simplification of the actual detailed Packing Instructions. As discussed at the Montreal Meeting. The working group is convinced of need for further specifications as indicated in WP/56. It was agreed further consideration should be given to the best location in the Technical Instructions where this text should be incorporated. In the first proposal in DGP-WG03/WP/56, it was proposed to make further elaboration in the general requirements per class. On the basis of further examination, it is now proposed the best location for placing this text will be Part 4, Chapter 1 under 1.1.3 (general requirements), because in this part and chapter "compatibility" has been named after.

3. PROPOSAL

3.1 Existing text Part 4 Chapter 1,1.1.3

Materials, such as some plastics, which can be significantly softened or rendered brittle or permeable by the temperatures likely to be experienced during transport or because of the chemical action of the contents or the use of a refrigerant, must not be used. Even though certain packagings are specified in individual packing instructions, it is, nevertheless, the responsibility of the shipper to ensure that such packagings are, in every way, compatible with the articles or substances to be contained within such packagings. This particularly applies to corrosivity, permeability, softening, premature aging and embrittlement. Parts of packagings which are in direct contact with dangerous goods:

- a) must not be affected or significantly weakened by those dangerous goods; and
- b) must not cause a dangerous effect, e.g. catalysing a reaction or reacting with the dangerous goods.

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

3.2 Based on the above it is proposed that the existing text regarding compatibility, Part 4 Chapter 1, 1.1.3, be modified as shown :

1,1.1.3 The shipper must in all situations where the use of certain inner and outer packagings is sustained, conform the Packing Instructions, or authorised by the competent authority, ensure that such packagings are in every way, compatible with the articles or substances to be contained within such packagings.

The shipper must, in all situations where closures are used, and other parts of the packaging are in contact with the articles or substances to be contained within the packagings, ensure that such closures and such parts of the packagings are in every way compatible with the articles or substances to be contained within such packagings.

The shipper also must ensure that materials, such as some plastics, which can be significantly softened or rendered brittle or permeable by the temperatures likely to be experienced during transport or because of the chemical action of the contents or the use of a refrigerant must not be used.

The shipper also must ensure that, when the following materials are used as packagings closures, or in part of packagings, all measures are taken to avoid that any of the described circumstances can occur during transport.

Glass: all substances containing the element fluorine can lead to chemical attack of the packaging material by the substance. These combinations must thus be avoided.

Metals like steel and aluminium: are susceptible to corrosion. Substances with corrosive properties against such materials (generally classified in class 8), including acids and alkaline substances, should not be packed in metal packaging and it is recommended not to do this even when a protective coating is present.

Investigations are necessary when a substance containing water is packed in a metal packaging.

Polymer materials: Relevant interactions for widely used polymer materials like polyethylene and polypropylene are swelling, chemical degradation and environmental stress cracking.

Further investigation is deemed necessary when the swelling rate is higher than 1 %, as is the case for many organic substances. In this case permeation of the substance through the packaging material can also be expected, which can lead to dangerous situations during transport.

Chemical degradation can occur by interaction with highly oxidising acids like nitric acid and further investigations are deemed necessary for these substances. For organic liquids with low swelling rates (less than 4 %) environmental stress cracking is a potential problem.

In carrying out the shippers responsibilities regarding the compatibility the shipper must ensure, that all measures are taken to avoid that examination and if necessary testing are not carried out in accordance with recent generally acknowledged levels of science

The shipper must produce research and/or test reports upon request of the competent authority, to identify that suitable research and/or tests have taken place in order to ensure that the responsibilities regarding compatibility be met.

— END —