



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)**

**TWENTY-FIRST MEETING**

**Montréal, 5 to 16 November 2007**

- Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel**  
**5.2: Reformatting of the packing instructions**

**PACKING INSTRUCTIONS — SUPPLEMENTARY COMMENTS**

(Presented by the Packing Instruction Working Group (PIWG))

**SUMMARY**

This working paper provides some additional comments and amendments to the packing instructions contained in DGP/21-WP/4.

Action by the DGP is in paragraph 2.

**1. INTRODUCTION**

- 1.1 The original brief to the Packing Instructions Working Group (PIWG) was to:
- a) restructure the packing instructions without changing the per package quantities in Table 3-1;
  - b) generally leave the quantities per inner packaging the same;
  - c) expand the packaging options in the packing instructions, consistent with the provisions of the UN Model Regulations and the principles of the ICAO Technical Instructions for safety in air transport; and
  - d) allow easier comparison between packing instructions and substances.

The PIWG believes it has followed these principles by only making a relatively small number of changes to produce the draft packing instructions attached to DGP/21-WP/4.

- 1.2 Whilst doing this work it is clear that the new structure shows a number of anomalies. These anomalies may relate to similar substances being treated in different ways or significant variations from the UN requirements. Generally these have been left and this working paper is intended to identify

those anomalies the PIWG has found (there may be others). Some of these will undoubtedly have to remain for good safety reasons but for others the reasons may be unclear and should perhaps be reviewed during the next biennium.

1.3 The anomalies do not affect the basic structure set out in DGP/21-WP/4 but some packing instructions may need minor modifications and there is a possibility that some of the new packing instructions can be done way with.

## 2. ACTION BY THE DGP

2.1 The DGP is invited to *consider* the following:

### 2.2 Corrections to WP4

2.2.1 Since DGP/21-WP/4 has been published, several editorial comments have been made and those received to date are:

- a) In the limited quantity packing instructions for liquids there is a statement:

“Inner packagings for liquids must be capable of passing a 95 kPa pressure differential test (4;1.1.6)”.

This is not correct as there are two pressures in 4;1.1.6, therefore the text will be changed to read:

“Inner packagings for liquids must be capable of passing a pressure differential test (4.1.1.6).”

- b) In Packing Instruction 967 quantities for single packagings have been omitted from the grey box. This should read:

| SINGLE PACKAGINGS |       |
|-------------------|-------|
| Passenger         | Cargo |
| 100 L             | 220 L |
| 100 L             | 220 L |
| 100 L             | 220 L |
| 100 L             | 220 L |
| 450 L             | 450 L |

- c) In Packing Instruction 968 quantities for single packagings have been omitted from the grey box. This should read:

| SINGLE PACKAGINGS |        |
|-------------------|--------|
| Passenger         | Cargo  |
| 400 kg            | 400 kg |
| 100 kg            | 200 kg |
| 100 kg            | 200 kg |

In addition, insert an additional line before “SINGLE PACKAGINGS”:

| Additional Packing requirements for single packagings   |  |
|---|--|
| For UN3077  |  |
| <ul style="list-style-type: none"> <li>Bags: paper (5M2), plastic film (5H4), textile (5L3), woven plastics (5H3) are permitted.</li> </ul> |  |

In the table for “SINGLE PACKAGINGS” in the column for Drums add “Fibre (1G)”.

- d) The CAO packing instructions for liquids for Class 3, Division 6.1 and Class 8 omitted the differentiation for the single packagings for PG I & II and those for PG III, i.e. only PG III should permit open head packagings. In addition for Class 3, Packing Group I plastic single packaging should not have been permitted. The existing single packagings tables should be revised as follows:

1) Packing Instructions 360-366 – Cargo Aircraft Only

| SINGLE PACKAGINGS PG I          |            |                        |                        |
|---------------------------------|------------|------------------------|------------------------|
| Composites                      | Cylinders  | Drums                  | Jerricans              |
| ALL                             | See 4; 2.7 | Aluminium (1B1)        | Aluminium (3B1)        |
|                                 |            | Other metal (1N1)      | Other metal (3N1)      |
|                                 |            | Steel (1A1)            | Steel (3A1)            |
| SINGLE PACKAGINGS PG II         |            |                        |                        |
| Composites                      | Cylinders  | Drums                  | Jerricans              |
| ALL                             | See 4; 2.7 | Aluminium (1B1)        | Aluminium (3B1)        |
|                                 |            | Other metal (1N1)      | Other metal (3N1)      |
|                                 |            | Plastic (1H1)          | Plastic (3H1)          |
|                                 |            | Steel (1A1)            | Steel (3A1)            |
| SINGLE PACKAGINGS (PG III only) |            |                        |                        |
| Composites                      | Cylinders  | Drums                  | Jerricans              |
| ALL                             | See 4; 2.7 | Aluminium (1B1, 1B2)   | Aluminium (3B1, 3B2)   |
|                                 |            | Other metal (1N1, 1N2) | Other metal (3N1, 3N2) |
|                                 |            | Plastic (1H1, 1H2)     | Plastic (3H1, 3H2)     |
|                                 |            | Steel (1A1, 1A2)       | Steel (3A1, 3A2)       |

2) Packing instructions 657-663 – Cargo Aircraft Only – Liquids

The existing single packagings table should be revised to read “SINGLE PACKAGINGS FOR PG III ONLY”, and a new table as shown below inserted above the existing table:

| SINGLE PACKAGINGS FOR PG I & II |            |                   |                   |
|---------------------------------|------------|-------------------|-------------------|
| Composites                      | Cylinders  | Drums             | Jerricans         |
| ALL                             | See 4; 2.7 | Aluminium (1B1)   | Aluminium (3B1)   |
|                                 |            | Other Metal (1N1) | Other Metal (3N1) |
|                                 |            | Plastic (1H1)     | Plastic (3H1)     |
|                                 |            | Steel (1A1)       | Steel (3A1)       |

3) Packing instructions 854-856 — Cargo Aircraft Only — Liquids.

The existing single packagings table should be revised to read “SINGLE PACKAGINGS FOR PG III ONLY”, and a new table as shown below inserted above the existing table:

| SINGLE PACKAGINGS FOR PG II |           |       |           |
|-----------------------------|-----------|-------|-----------|
| Composites                  | Cylinders | Drums | Jerricans |

|     |            |                   |                   |  |
|-----|------------|-------------------|-------------------|--|
| ALL | See 4; 2.7 | Aluminium (1B1)   | Aluminium (3B1)   |  |
|     |            | Other Metal (1N1) | Other Metal (3N1) |  |
|     |            | Plastic (1H1)     | Plastic (3H1)     |  |
|     |            | Steel (1A1)       | Steel (3A1)       |  |

### 2.3 Anomalies identified which the PIWG consider can be resolved at DGP/21

- a) Packing Instruction 370 and Y370. The base material used in Polyester Resin Kits is always a Class 3 flammable liquid but the activator organic peroxide can be a solid or liquid in a bottle or tube. The units used for the base should be changed to litres as in the surface modes – those for the activator can remain as now.

The columns in both packing instructions need to be changed to make it clear that LIQUID and SOLID only relate to the activator, perhaps by changing the headings to “for LIQUID activator” and “for SOLID activator” respectively.

The base is normally sold in standard paint tin sizes with the activator either put into a special design of lid or alongside in the carton. It is suggested therefore that for Packing Instruction Y370 the base material size is amended to 1 litre and for Packing Instruction 370 to 5 litres (1 litre for glass). The Total Quantity per package could then be amended to, say, 1.5kg and 6kg respectively to give some headroom, making an allowance for the tin, tube/bottle and carton used. It is after all the size of the inners that is the most important and significant for safety.

Amending Packing Instruction 370 to 5 litres and 125ml/500g will align with the Limited Quantities size limits for surface modes of transport. This means that if an LQ pack is presented to a packer for re-packing for air transport there is no worry about the sizes of the inner not being appropriate. The re-packer only needs to be sure about the new outer (and any intermediate) packaging being suitable.

| <b>Packing Instruction 370</b>   |                                     |   |  |                                   |                          |
|--|-------------------------------------|---|--|-----------------------------------|--------------------------|
| <b>Passenger and Cargo Aircraft For UN3269 (PGII or III) only</b>  |                                     |   |  |                                   |                          |
| <b>General Requirements</b><br>Part 4 Chapter 1 requirements must be met including: <ol style="list-style-type: none"> <li><b>1) Compatibility Requirements</b> <ul style="list-style-type: none"> <li>• Substances must be compatible with their packagings as required by 4; 1.1.3</li> <li>• Metal packagings must be corrosion resistant or with protection against corrosion for substances with a class 8 sub risk</li> </ul> </li> <li><b>2) Closure Requirements</b> <ul style="list-style-type: none"> <li>• Closures must meet the requirements of 4; 1.1.4</li> </ul> </li> </ol> |                                     |   |  |                                   |                          |
| <b>COMBINATION PACKAGINGS</b>  |                                     |   |  |                                   | <b>SINGLE PACKAGINGS</b> |
| <b>Polyester resin kits</b>  | <b>Inner Packaging (see 6: 3.2)</b> | <b>Inner packaging quantity (per receptacle)<br/>For LIQUID activator</b> | <b>Inner packaging quantity (per receptacle)<br/>For SOLID activator</b> | <b>Total Quantity Per Package</b> |                          |
| <b>Activator (Organic peroxide)</b>  | Plastic*                            | <b>125mL</b>  | <b>500g</b>  | <b>6.0 kg</b>                     | <b>NO</b>                |
|  | Metal*                              | <b>125mL</b>  | <b>500g</b>  |                                   |                          |
| <b>Base material Class 3 PG II or III</b>  | Glass                               | <b>1.0 L</b>  | <b>1.0 L</b>   |                                   |                          |
|  | Plastic                             | <b>5.0 L</b>  | <b>5.0 L</b>   |                                   |                          |
|  | Metal                               | <b>5.0 L</b>  | <b>5.0 L</b>   |                                   |                          |
| * Including tubes  |                                     |   |  |                                   |                          |
| <b>ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS</b>  |                                     |   |  |                                   |                          |
| The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of leakage (See 4: 1.1.7)   |                                     |   |  |                                   |                          |
| <b>OUTER PACKAGINGS OF COMBINATION PACKAGINGS</b>  |                                     |   |  |                                   |                          |
|  | <b>Boxes</b>                        | <b>Drums</b>  | <b>Jerricans</b>   |                                   |                          |
|  | Aluminium (4B)                      | Aluminium (1B2)   | Aluminium (3B2)  |                                   |                          |
|  | Fibreboard (4G)                     | Fibre (1G)  | Other Metal (3N2)  |                                   |                          |
|  | Natural wood (4C1, 4C2)             | Other Metal (1N2)   | Plastics (3H2)   |                                   |                          |
|  | Plastics (4H1, 4H2)                 | Plastics (1H2)  | Steel (3A2)  |                                   |                          |
|  | Plywood (4D)                        | Steel (1A2)   |  |                                   |                          |
|  | Reconstituted wood (4F)             |   |  |                                   |                          |
|  | Steel (4A)                          |   |  |                                   |                          |

| <b>Packing Instruction Y370</b>  |                                     |   |  |                                   |                                     |                          |
|--|-------------------------------------|---|--|-----------------------------------|-------------------------------------|--------------------------|
| <b>Limited Quantities for UN3269 (PGII or III) only</b>  |                                     |   |  |                                   |                                     |                          |
| <b>Passenger and Cargo Aircraft</b>  |                                     |   |  |                                   |                                     |                          |
| <b>General Requirements</b>  |                                     |   |  |                                   |                                     |                          |
| Part 4 Chapter 1 requirements must be met (except that 4: 1.1.2, 1.1.8 c, 1.1.8 e and 1.1.16 do not apply) including:  |                                     |   |  |                                   |                                     |                          |
| <b>1) Compatibility Requirements</b>   |                                     |   |  |                                   |                                     |                          |
| <ul style="list-style-type: none"> <li>Substances must be compatible with their packagings as required by 4: 1.1.3</li> <li>Metal packagings must be corrosion resistant or with protection against corrosion for substances with a class 8 sub risk</li> </ul>  |                                     |   |  |                                   |                                     |                          |
| <b>2) Closure Requirements</b>   |                                     |   |  |                                   |                                     |                          |
| <ul style="list-style-type: none"> <li>Closures must meet the requirements of 4: 1.1.4</li> </ul>  |                                     |   |  |                                   |                                     |                          |
| <b>3) Limited Quantity Requirements</b>  |                                     |   |  |                                   |                                     |                          |
| <ul style="list-style-type: none"> <li>Part 3 Chapter 4 requirements must be met including:</li> <li>the capability of the package to pass a drop test of 1.2m and</li> <li>a 24 hour stacking test and</li> <li>Inner packagings for liquids must be capable of passing a 95kPa pressure differential test (4:1.1.6)</li> </ul> |                                     |   |  |                                   |                                     |                          |
| <b>COMBINATION PACKAGINGS</b>  |                                     |   |  |                                   |                                     | <b>SINGLE PACKAGINGS</b> |
| <b>Polyester resin kits</b>  | <b>Inner Packaging (see 6: 3.2)</b> | <b>Inner packaging quantity (per receptacle) For LIQUID activator</b> | <b>Inner packaging quantity (per receptacle) For SOLID activator</b> | <b>Total Quantity Per Package</b> | <b>Total gross mass per package</b> |                          |
| <b>Activator (Organic peroxide)</b>  | Plastic*                            | <b>30 mL</b>  | <b>100 g</b>   | <b>1.5 kg</b>                     | <b>30 kg</b>                        | <b>NO</b>                |
|  | Metal*                              | <b>30 mL</b>  | <b>100 g</b>   |                                   |                                     |                          |
| <b>Base material Class 3 PG II or III</b>  | Glass                               | <b>1.0 L</b>  | <b>1.0 L</b>   |                                   |                                     |                          |
|  | Plastic                             | <b>1.0 L</b>  | <b>1.0 L</b>   |                                   |                                     |                          |
|  | Metal                               | <b>1.0 L</b>  | <b>1.0 L</b>   |                                   |                                     |                          |
| <i>* Including tubes</i>   |                                     |   |  |                                   |                                     |                          |
| <b>ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS</b>  |                                     |   |  |                                   |                                     |                          |
| The components may be placed in the same outer packaging provided that they will not interact dangerously in the event of leakage (See 4: 1.1.7)   |                                     |   |  |                                   |                                     |                          |
| <b>OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6:3.1)</b>  |                                     |   |  |                                   |                                     |                          |
| <b>Boxes</b>   | <b>Drums</b>                        |   | <b>Jerricans</b>   |                                   |                                     |                          |
| Aluminium  | Aluminium                           |   | Aluminium  |                                   |                                     |                          |
| Fibreboard   | Fibre                               |   | Plastics   |                                   |                                     |                          |
| Natural wood   | Plastics                            |   | Steel  |                                   |                                     |                          |
| Plastics   | Other Metal                         |   |  |                                   |                                     |                          |
| Plywood  | Steel                               |   |  |                                   |                                     |                          |
| Reconstituted wood   |                                     |   |  |                                   |                                     |                          |
| Steel  |                                     |   |  |                                   |                                     |                          |

- b) Packing Instruction 953 and Packing Instruction 954 for UN 3090 – lithium batteries and UN 3091 – lithium batteries packed with equipment, respectively the maximum gross mass is 35 kg whereas the maximum gross mass in the other modal regulations is 30 kg. It is proposed that for UN 3090 (and for UN 3480 – Lithium ion batteries) that the value in column 12 is amended to be 30 kg G and that in Packing Instruction 953 and Packing Instruction 954 the Quantity CARGO be amended to read “30 kg Gross”. The panel is asked to consider the adoption of this change with effect the 2009-2010 edition of the Technical Instructions. The effect would be to revise the second paragraph of Packing Instruction 918 as follows:

“Lithium cells or batteries packed with equipment must meet the requirement of Packing Instruction 903 other than those related to packaging. Lithium cells and batteries must be packed in fibreboard boxes (4G) or fibre drums (1G) of Packing Group II and in such a manner as to effectively prevent movement which could lead to short circuits. Such packages must not exceed 5 kg gross mass for passenger aircraft or ~~35~~ 30 kg gross mass for cargo aircraft.”

- c) Packing Instruction Y963 (UN 3316 – Chemical kit or First aid kit). This appears to be unnecessary. The UN, IMDG Code and RID/ADR do not authorise limited quantities for this UN number (49CFR does appear to be different). It is proposed to seek clarification from the UN Subcommittee on the wording of SP 251 in the UN Model Regulations to determine if this intended to permit chemical kits as limited quantities provided that the individual substances are permitted. If the UN Subcommittee confirm that UN 3316 is not permitted as limited quantities it is proposed to remove this packing instruction and the “Y” packing instruction and quantity should also be removed from columns 9/10 of Table 3-1.

The panel is asked to consider adoption of this change with effect the 2009-2010 edition of the Technical Instructions if the UN Subcommittee confirms at the 32<sup>nd</sup> meeting in December 2007 that it is not intended that UN 3316 be permitted in limited quantities.

## 2.4 Anomalies which need further thought and consideration

2.4.1 The PIWG do not see the items listed in this section as being an area they should investigate, rather it should be seen as an invitation to panel members and any other interested party to comment or propose some changes.

- a) Class 3. Packing Instruction 374 and Y374, these packing instructions are for mercaptans and have had to be separated from 350-355/360-366 because the permitted quantities are quite different from other Class 3 substances.
- b) Class 4. Packing Instruction 460 and Y460 (UN 1944 – Matches, safety and UN 1945 — Matches, wax ‘vesta’). The requirements would appear to be significantly out of date. There is some doubt that any matches are packed in this way. It has been observed that matches are placed in emergency ration kits and they will not meet this packing instruction. The UN requirements are simpler.

## 2.5 **Revision of packing instructions in the Supplement**

2.5.1 Additional material will be proposed for inclusion into the Supplement that will align the packing instructions in the Supplement with those developed through the reformatting exercise. It is also proposed that the Supplement have guidance to States on packaging and packing for specific types of substances.

## 2.6 **Matters to be brought to the attention of the UN**

2.6.1 If adopted the packing instructions should be submitted to the UN Subcommittee for information. At the same time their attention should be drawn to the special packing instructions particularly those in Class 9 addressing lithium batteries and life saving appliances where the new structure could probably be used by the Model Regulations.

2.6.2 In addition the new text for Part 4;1.1.4 could be considered for inclusion in 4.1.1 of the Model Regulations.

— END —