

DANGEROUS GOODS PANEL

Dubai, 31 March to 4 April 2003

COMMENTS ON WP/51

(Presented by G. Leach)

WP/51 has been reviewed by the former chairperson of the DGP, Miss K.R. Warner; her comments are presented for the information of the working group.

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1. COMMENTS ON THE PROPOSED PACKING INSTRUCTIONS IN ANNEX 1

1.1 The time, work and expertise that has gone into the production of the proposed new packing instructions should be greatly appreciated by the Dangerous Goods Panel, since there are many substances which have made it difficult to accomplish a simplified and harmonized system. What has been achieved is a major reduction in the overall number and an updating of the requirements without any diminution in the level of safety or radical change in the philosophy of the Technical Instructions regarding the packing instructions. The authors are to be congratulated.

1.2 On the cover of Annex 1 there is a comment about the font for the packing instructions. It should be noted that the font and, also, to some extent the format/layout of the packing instructions will be dependent on ICAO house-style and the editorial section of ICAO.

1.3 The review of the packing instructions has only looked in a cursory way at the standard packing instructions (eg: 305 v 3X1, 415 v 4X2, etc); the review has concentrated on comparing the specific requirements, such as those in the PPRs.

1.4 With some exceptions, the quantities shown in the listings for inner packagings in each packing instruction have not been considered since it is known these are subject to discussion by the Dangerous Goods Panel; however, the method devised at the meeting which was held at Gatwick several years ago remains the preferred way of rationalising, as far as possible, the inner packagings quantities.

1.5 A long time ago the Panel decided that "packaging" would be a singular term, with "packagings" as the plural. This means that whenever packaging is used it should be followed by the singular "is" and packagings by the plural "are"; also when more than one packaging is referred to the plural form should be used. It has been observed that in the draft packing instructions in Annex 1 "plastics" is used on a number of occasions to describe a particular packaging type; it should be noted that the Panel has made it known that in the Technical Instructions they wish to use the term in its singular form when describing plastic packagings, to differentiate it from plastics explosive. This means that in Annex 1 both "plastic" and "plastics" are being used to describe the same type of packagings (eg: "Plastic (IP2)" in 3X1 and "Plastics (IP2)" in 4X1).

1.6 General Comments on the Layout of the Packing Instructions

1.6.1 In looking at Annex 1, it has been apparent that there are several different authors who have contributed work to the packing instructions; this means that although there is one basic layout for them there are variations on this layout between the different series and, sometimes, between different packing instructions in the same series. Note - series means all the packing instructions in the 300, 400, etc (or 3XX, 4XX, etc) series of packing instructions. Subject to the comments below, it is thought that generally the layout shown for the packing instructions would be user-friendly and provide clear and unambiguous requirements; having the passenger and cargo aircraft requirements in the same packing instruction would not be confusing and should not make accidental misinterpretation of the requirements more likely.

1.6.2 All the packing instructions show the combination packagings, with inner and outer packagings separately, and single packagings (when applicable). Although the layout in general probably conforms to that in the UN Model Regulations (UNMR), the need to have separate entries for passenger and cargo aircraft means there is more information than that in the equivalent packing instruction in the UNMR;

unfortunately, this makes for a somewhat cluttered layout, particularly for the single packagings. Also, whilst the layout in the UNMR may be suitable for a document that does not have direct legal applicability, for the Technical Instructions it will be necessary to ensure all the requirements are laid out in such a manner that there is no loophole and no conflicting or confusing information. All the following comments are directed to that end.

1.6.3 Using packing instruction 3X1 as the example (but the same is true to a greater or lesser extent for packing instructions in other series) the following is observed:

- (a) the word "authorized" in the preamble to inner packagings is not the usual term; it should be "permitted" (but see comments below under Requirement on Applicability);
- (b) the word "prohibited" is used in relation to inner packagings but "forbidden" is used in relation to single packagings, when it would appear that they mean the same thing; it is thought it should be the word "forbidden" that used;
- (c) in the listing of inner packagings "IP3A" is shown in the packing instructions in the 3XX, 6XX and 8XX series;
- (d) there is a requirement under the inner packagings stating that the following inner packagings are permitted (and the permitted quantities) but there is nothing similar under the outer and single packagings (whilst this is not true for the packing instructions in the 4XX and 5XX series there are other editorial matters - see comment below under Requirement on Acceptability);
- (e) where quantities in the inner packagings listing are for less than 1 L / 1 kg, it needs to be ensured the "0" is shown - eg: 0.5 L (see packing instruction 4X17) or 0.5 kg (see packing instruction Y5XX);
- (f) the headings for Combination, Inner, Outer and Single Packagings are in the same font, size and position within the packing instruction and it would improve clarity if the format in the current Technical Instructions was adopted, so that the heading for Inner and Outer packagings was, eg, indented and in italics;
- (g) the lists of outer packagings are inconsistent in that they are in neither a numerical nor an alphabetical listing (but this is how they appear in the current Technical Instructions and if the packing instructions are being revised this should be corrected); an alphabetical listing would have the advantage of making the lists in the "Y" packing instructions and the other packing instructions consistent;
- (h) whilst brief descriptions are used for outer packagings (eg: "steel (1A2)" under "drum"), the same is not true for single packagings, where only the numerical reference appears (eg: "1A2"). Given the number of single packagings, it is appreciated why this has been done but a consistent method needs to be used for showing packaging types; the Technical Instructions have always used brief descriptions for inner, outer and single packagings and the draft packing instructions in Annex 1 still do so for inner and outer packagings; whilst it

might make the single packagings listings much longer, for consistency they should be shown with both brief descriptions and references, as in the current Technical Instructions;

- (i) in many packing instructions the listings of single packagings are extremely repetitive and there is little variation in them; as far as can be seen the variations are a few prohibitions on some packaging types for packing group I and II substances. A much simpler and far more user-friendly layout would be to have them only once for passenger and once for cargo aircraft, with additional requirements as necessary indicating the prohibitions. To assist with the layout, it would be better if the cargo aircraft listings were under those for passenger aircraft, rather than side by side as in the drafts;
- (j) occasionally the numerical listing of single packagings is not consistent (eg: for composite packagings 6HD1 is out of order) and, depending on whether or not they are listed by brief description (see (h) above) this needs to be corrected;
- (k) in the listings of single packagings, the word "forbidden" is shown vertically; although the ICAO editorial department will, no doubt, have the final say, it is thought that it should be shown horizontally across the columns to which it applies;
- (l) in some of the Additional Requirements and PPRs the word "shall" is used; in ICAO the word used is "must".

1.7 The above are the general comments about the layout of the packing instructions, using packing instruction 3X1 as the example. The following paragraphs expand on some of the comments and offer further ones on the question of layout.

1.8 Requirement on Acceptability

1.8.1 Sub-paragraphs (a) and (d) above refer. All of the packing instructions have a similar statement under the inner packagings heading concerning the acceptability of inner packagings and the permitted quantity (eg: packing instruction 3X1 states "The following inner packagings are authorized for the indicated volumes of liquid for passenger or cargo aircraft. When a packaging is not permitted the word "prohibited" is indicated.") In the 4XX and 5XX series there are also statements under the outer packagings and single packagings but these do not appear in the 3XX, 6XX, 8XX and 9XX series. It is considered the wording of the requirement under the inner packagings heading needs editorial amendment, since "authorized" is not the word normally used (it should be "permitted"); the word "forbidden" should be used in lieu of "prohibited" (see (a) above) and it does not take into account any restriction in the additional requirements or a PPR on either type of packaging or quantity (ie: there is a conflict between a requirement that states the following inner packagings are permitted for the quantities of liquid/solid indicated and an additional requirements or PPR which restricts the permitted types of packagings and quantities). As has been noted, in the 4XX and 5XX series there are basic statements under the headings of outer and single packagings but these also do not take into account any restrictions in an additional requirement or PPR. An overarching requirement is needed to state that dangerous goods have to be packed according to the packing instruction (this is missing from the packing instructions in the current Technical Instructions) but it is considered that a much tidier way of doing this would be to make a standard requirement at the beginning of each packing instruction as a separate paragraph after that concerning the meeting of the general packing requirements, so that individual statements are not necessary under each heading. This paragraph could read:

The following packagings are permitted as indicated below for [passenger or] cargo aircraft, providing the quantities shown for inner packagings are not exceeded in combination packagings and any additional requirements or particular packing requirements that apply are complied with. [Where the word "forbidden" appears it indicates the packaging is not permitted.]

1.8.2 The parts of this suggestion which are in parenthesis indicate where the text could be omitted, depending on the packing instruction. It seems likely that the sentence concerning additional requirements or particular packing requirements would always be needed.

1.8.3 If it is decided to keep the individual requirements in lieu of the paragraph suggested above the following are comments on these individual requirements/statements as they appear in the draft packing instructions. Using packing instruction 4X1 as an example, if the paragraph suggested above appears, none of the statements before the listings of inner, outer and single packagings would be needed; but if it is decided to keep the individual statements under each heading, the statement before the list of outer packagings does not need to refer to "for all inner packagings permitted above"; this is redundant since the permitted inner packagings are automatically made so through the wording used (irrespective of whether it is the wording currently shown or that suggested in the comments on the Requirement on Acceptability). Using packing instruction 4X1 as the example, for consistency under the heading of single packagings, it should read "The following single packagings are permitted". Using packing instruction 4X1 as the example, the statement under the heading of combination packagings states "for passenger and cargo aircraft"; whilst in, eg: 3X1 it states "for passenger or cargo aircraft". It should be "or since it is believed the accepted rule is that 'or' includes 'and' but 'and' does not automatically include 'or'. Using packing instructions 6X1 and 8X1 as the examples, in the requirement on applicability under the inner packagings heading, the phrase is "quantities of liquid"; whereas in packing instruction 3X1 it is "volume of liquid"; the same phrase needs to be used. Using packing instruction 3X4 as the example, at the end of the requirement at the beginning of the packing instruction it states " ... unless otherwise indicated."; it is not understood to what this refers and it does not appear to be relevant. The comments in this paragraph concerning the individual statements under each heading should not be interpreted as meaning they are preferred to the general requirement suggested above under the Requirement on Applicability; that is a much better way of setting out the requirements on the acceptability of packagings.

1.9 Headings for Packaging Types

1.9.1 Sub-paragraph (f) refers. It is noticeable in the 4XX and 5XX series that the "inner" and "outer" sub-headings are not used. It is thought these are necessary since they aid the user and are simpler to follow; they would be needed if the general statement suggested above is adopted.

1.10 Particular Packing Requirements

1.10.1 It is the particular packing requirements on which there are the largest number of comments, both general and against specific PPRs. It has been observed that often they appear to have been written in shorthand; ie: they contain abbreviated text, abbreviations are used, sentences are not complete, etc. For the Technical Instructions they will need to be written in standard English and in a clear and unambiguous way. For specific PPRs, the comments are made under the relevant packing instruction. Some general comments are made below.

1.11 Numbering system

1.11.1 At present in Annex 1 there are several different numbering systems being used. In PI 3X1 the number is shown as "PPR3X1"; in PI 3X3, there is "3X3-1" and "3X3-2"; in the 4XX series of packing instructions the first PPR is shown as "PP4-1" and they continue sequentially through all subsequent packing instructions up to "PP4-16"; in the 6XX series they are shown as "PPR[PI]-1", "PPR[PI]-2", etc; and in the 8XX series they number from 1 onwards in each packing instruction, with the same number being used in the equivalent "Y" packing instruction. Since there will be many more PPRs than at present, careful thought will need to be given to their numbering, particularly if they are to be included in Table 3-1. As an example, Benzyl bromide, UN 1737, is in packing instructions 6X1 and Y6X1; with the present numbering system used in Annex 1, the PPRs would appear in Table 3-1 as: PPR6X1-1, PPR6X1-4, PPRY6X1-1 and PPRY6X1-5. As currently shown most of the PPRs are complex numbers, containing both letters and numbers (as in these examples). What appears to be a complex number to the authors of the Technical Instructions (who will understand how it is made up) and to shippers will be very different and the number "PPRY6X1-1" will be considered by shippers to be very complex. Complex numbers are not only difficult to understand and remember (most users of the Technical Instructions will not appreciate how the number is made up and think it important to remember every part of it) but they will take up considerable space in the column. Before PPR numbering is introduced some thought should be given as to how the actual number will appear. Until now, although the Technical Instructions have always referred to particular packing requirements, the abbreviation "PPR" was not used. Also there were relatively few numbers and a centralised numbering system so that, eg: PPR 13 always had the same meaning irrespective of in which packing instruction it was shown. With the new packing instructions it does seem there will be a need to have many more particular packing requirements and, whilst some of them will be the same (eg: an equivalent of the present PPR 13), there will be many that apply only to a single or restricted number of packing instructions. Over time, PPRs will no doubt be deleted or added to, so that in due course the numbers will no longer be sequential either within a packing instruction or over a number of packing instructions. Although the highest number in the PPRs in the Technical Instructions is 22 there are no longer twenty two particular packing requirements. A PPR is only a "hook" to take the user to a piece of information within a packing instruction; if the numbering of PPRs is discrete within each packing instruction, the number does not need to be complex. If they are shown in Table 3-1, it is still not necessary for the packing instruction number to be included in the PPR number, since all the user will take from the Table is a number from a column headed "Particular Packing Requirements". The explanation for the column should explain that this number will be found in the packing instruction quoted in column(s) A or B. Because of the possibility that the packing instruction for limited quantities will differ from the other packing instruction(s), a numbering system should probably indicate the difference between such packing instructions. If the above principles are adopted, it is only necessary to have 1, 2, 3, etc, (or Y1, Y2, Y3, etc, for limited quantities) as PPR numbers in each packing instruction; if it is felt this is too abbreviated, a suitable numbering system would be PR1, PR2, PR3, etc, for each PPR in a packing instruction; and PRY1, PRY2, etc, for those in limited quantities packing instructions. In each packing instruction the PPRs would start with PR1 or PRY1 as appropriate. It is irrelevant that the same requirement could have a different number in different packing instructions (this is already the case in the draft packing instructions for some specific requirements); in the current Technical Instructions the actual requirement is always shown in full at the bottom of each packing instruction and it is wondered how many shippers realise that there is a centralized numbering system. Moreover, centralized numbering systems or numbering systems that cover more than a single packing instruction would mean keeping a master record of the numbers in order to avoid errors and it would be another record that needed to be kept up-to-date independently of amending the Technical Instructions. The problem with numbering the PPRs is made worse by including them in Table 3-1; if they only appeared and were complete in each packing instruction, they could be numbered 1, 2, 3, etc.

1.12 Use of "For"

1.12.1 Every PPR starts with the word "For" (eg: "For UN 0000 metal inner packagings must not be used."). It is not known how easy it is to translate the word into another language and if it causes difficulties in keeping the sense the same but it is totally redundant and its use could be avoided. A PPR would have the same meaning as the example if it read: "UN 0000, metal inner packagings must not be used. Currently, often punctuation is not used correctly (or at all) in PPRs so their meaning is not clear. Even if the word "for" is not removed, it should be ensured there is a comma after the end of the list of UN numbers to which a PPR applies.

1.13 Cargo Aircraft Only Packing Instructions

1.13.1 PI 3X4 is an example of a packing instruction applicable only to cargo aircraft. If this is made clear in the introduction (see comment on Requirement of Acceptability) the headings of "Cargo Aircraft Only" in such packing instructions are redundant.

1.14 Single Packagings

1.14.1 Packing instruction Y3XX is an example of a packing instruction for limited quantities; as such, single packagings are not permitted. For consistency, it is thought that there should be a heading for Single packagings (as for other packing instructions) and that under it should be the statement that single packagings are not permitted (for Y3XX this would also mean deleting it from the top).

1.15 Packing Group I and Limited Quantities

1.15.1 Packing instruction Y3XX is an example of a packing instruction for limited quantities. In the listing for inner packagings there is a column for packing group I, which shows "Prohibited". Since packing group I substances are forbidden in limited quantities it is considered this column is redundant. In Table 3-1 there will not be a "Y" packing instruction for a packing group I substance or against the packing group I entry where there are multiple packing groups for the same substance; so a shipper will not be given the option of a packing instruction and putting a prohibition in a packing instruction is not necessary.

1.16 References to Additional Requirements

1.16.1 Using packing instruction 4X1 as the example, this has numerical references to the additional requirements (AR) beside the packagings to which they refer. It is not thought these are necessary and will only make it more difficult editorially to format the packing instructions. PPRs, which might also refer only to specific packagings are not similarly identified. It will be for trainers to ensure their students realise the important and relevance of any additional requirements that might apply.

1.17 Numbering of Packing Instructions

1.17.1 In the 4XX series, there are several large gaps in the numbering of the packing instructions, but these are not explained. It is appreciated that at present the packing instructions are only in draft form but when they are finally agreed, the number needs to be adjusted, taking into account any packing instructions that are in the Supplement.

1.18 Prohibited Single Packagings on Passenger Aircraft

1.18.1 In the 8XX series, where single packagings are not permitted on passenger aircraft the words "Not allowed" are used; it is thought these should be replaced by "forbidden" (see (b) under General Comments on the Layout of the Packing Instructions).

1.19 Compatibility Requirements

1.19.1 It has been observed that all of the requirements that relate to matters of compatibility have been earmarked for removal from the packing instructions. It is known this is a subject on which opinions are divided in the Dangerous Goods Panel. It is felt that there are general packing requirements concerning compatibility and that, if necessary, users should be directed to them. To show compatibility requirements in addition to these may lead to them being ignored. It should be a general rule that requirements are shown in the Technical Instructions only once, unless there is a fundamental safety reason to repeat a specific requirement or provide a cross reference; to keep repeating a selected few always begs the question as to what about all the rest. Many of the compatibility requirements are in PPRs; there are sufficient of them without adding the ones that concern compatibility. If the Dangerous Goods Panel believe that reference should be made to the need to ensure a packaging is compatible with its contents, it would be better as a general statement; it could be added as a paragraph in Part 4, Chapter 2 or, if something more specific is required, to the requirement which it is suggested be placed at the beginning of each packing instruction (see suggested wording under the comments on Requirement on Applicability).

1.20 Abbreviation of "Packing Group"

1.20.1 In some of the packing instructions, most often in the PPRs, packing group has been abbreviated to "PG"; it needs to be ensured packing group is always written in full.

1.21 Packing Instructions in the Supplement

1.21.1 At present the exercise for revising the packing instructions appears to have concentrated on those in the main Technical Instructions; to complete the exercise the packing instructions in the Supplement also need to be reviewed and brought into alignment with those in the main document.

1.22 Comments on Specific Packing Instructions

All the following comments are in addition to those made above in general.

1.22.1 Packing Instruction 3X3

1.22.1.1 At the beginning there is a sentence which reads: "Combination packagings with inner plastic packagings and single outer plastic packagings are not permitted for PG I liquids.". This was a requirement in the Technical Instructions several years ago and it is thought it was removed since it was considered that if such a package was successfully tested there was no reason to prohibit it. It is not clear if the requirement is aimed at package safety or compatibility of package with contents (ie: if the substance attacks the inner packaging and causes a leak, it will also attack the outer packaging). If the latter explanation is the reason

for the prohibition, it can be argued that it should be deleted. It is noted that a packing group I substance could be carried in a plastic composite single packaging. However, if the requirement is in the UNMR or it is considered it needs to be reinstated, it is not very clearly written; for instance the use of the word "single" is not understood and could cause confusion over whether it means a single or combination packaging; and "with" does not automatically mean the combination packaging is a plastic inner packaging contained in a plastic outer packaging (eg: it could mean an plastic inner packaging in an outer fibreboard box). Moreover, the terms "inner packaging" and "outer packaging" are defined and the words should never be split by the description of the packaging type (eg: it should be a plastic inner packaging and not an inner plastic packaging). If the requirement is to be retained it is thought it should be: "Combination packagings consisting of plastic inner packagings contained in a plastic outer packaging are not permitted for packing group I liquids." However, see the following paragraph regarding the Additional Requirements, since plastic inner packagings need to be packed in an intermediate packaging; and it is not known if this will have any effect on the prohibition on plastic inner and plastic outer packagings and if it is still relevant if the intermediate packaging is metal.

1.22.1.2 Under the Additional Requirements is the need for plastic or glass inner packagings to be packed in an intermediate packaging before being placed in the outer packaging. If the requirement at the beginning of the packing instruction is retained concerning plastic packagings, the Additional Requirement needs to be reviewed to consider the acceptability of plastic intermediate packagings for packing group I substances if two of the three packagings are plastic (ie: a plastic inner and intermediate or a glass inner packaging, an intermediate of plastic and an outer of plastic). Also, there is an Additional Requirement placing a prohibition on aluminium packagings. It is presumed this applies only to metal IP3 packagings (ie: not the outer packagings of combination packagings); in which case it should be written as: "Aluminium inner packagings (IP3) are not permitted."

1.22.1.3 There is a similar problem under the PPRs. In 1 and 2 it needs to be made clear whether the metal and plastic refer only to inner packagings or to inner and single packagings; ie: it is presumed there is no intention to prohibit outer packagings of metal / plastic.

1.22.2 Packing Instructions 3X4 and 3X5

It is appreciated these packing instructions are for cargo aircraft only but there is no reason for them to deviate from the layout used in other packing instructions. Therefore, the listing of inner packagings should be turned around so the packaging types are in the left-hand column.

1.22.3 Packing instruction 3X5

In the comments under this packing instruction, it states that the quantity for glass inner packagings for several UN numbers would decrease to 0.5 L; it should be noted that at present in the current packing instruction 304, UN 2983 is only permitted in a glass ampoule at 0.5 L. More importantly, packing instruction 304 has PPR 8, which restricts UN 2983 to gas cylinders or other pressure vessels when metal inner packagings are used. This has not been reflected in packing instruction 3X5.

1.22.4 Packing Instruction Y3XX

The last PPR for UN 1184 does not make clear whether it is only aluminium inner packagings or both aluminium inner and outer packagings. Also, this prohibition does not appear in packing instruction 3X2 nor in the current packing instruction Y306 for this UN number. In packing instruction 3X3 there is a prohibition on metal inner packagings for UN 1723 and plastic inner packagings for UN 1298 but these prohibitions are not shown in packing instruction Y3XX; it is assumed these substances are included in Y3XX since they are currently listed in packing instruction Y306.

1.22.5 Packing Instruction 4X1

AR 3 could be misunderstood; it is presumed the intention is to say that there may be a lower quantity limitation per inner packaging to that shown in the inner packagings listing. However, there is nothing in the AR that would prohibit a quantity limitation per inner packaging that is in excess of that permitted in the packing instruction. Similar is true for the type of packaging; there is nothing in the AR that would prohibit another type of inner packaging. If the AR also addresses the maximum net quantity per package, this will need to be covered by a special provision.

PP4-1: on the presumption that there is no missing UN number, the word "and" needs to be relocated to before the last UN number.

PP4-2: in the current packing instruction 416, UN 1310 is only permitted in glass inner packagings, which means that under the new packing instruction there would be a complete reversal of the permitted packagings. Also, UN 1410 and 1419 are permitted in glass inner packagings in the current packing instruction 412 but would be forbidden by PP4-2.

PP4-4: the word "only" is unnecessary. Also, the limitation on quantity applies only to glass and not to earthenware; however, in packing instruction 4X7, a similar limitation applies to both glass and earthenware. Are these differences intentional ?

PP4-5: this is an example of a PPR written in shorthand. It should read: " ... 2257, plastic inner packagings and plastic single packagings are not permitted."

PP4-6: the PPR appears to have been modelled on PPR 22 in the current packing instruction 412. If this is so, UN 3208 and 3209 are missing from the list. However, PP4-6 introduces a prohibition on single packagings which is not in packing instruction 412; this permits some single packagings for all the substances listed, together with UN 3208 and 3209.

1.22.6 Packing Instruction 4X7

PP4-13: this is a very good example of a PPR written in shorthand; also to ensure there is no error when translating text, a prohibition should be stated clearly. The existing packing instruction for UN 3241 (packing instruction 434) does not permit metal single packaging; and the net quantity for an IP5 is 1 kg. This means that this PPR should read: "UN 3241, metal inner packagings, metal outer packagings and metal single packagings are not permitted. The net mass in glass and earthenware inner packagings must not exceed 0.5 kg. Plastic bags (IP5) are permitted in addition to the above inner packagings providing the net mass contained in them does not exceed [1] kg."

PP4-14: when translating text it is possible to misunderstand the phrase "packagings are limited to", so that it requires the net mass to only be exactly the quantity stated. This PPR needs to be rewritten so it reads: "UN 1338, the net mass in glass or earthenware inner packagings must not exceed 0.5 kg for passenger aircraft and 1 kg for cargo aircraft."

1.22.7 Packing Instruction 4X8

PP4-15: it is presumed this PPR should read: " .. and 3209, plastic inner packagings and plastic single packagings are not permitted."

The note under this packing instruction deals with UN 3207 and cylinders but it does not seem accurate and existing requirements of the Technical Instructions do not appear to have been taken into account in the proposed packing instruction 4X8. In the current packing instructions 409, 431 and 432, UN 3207 needs to be in gas cylinders or other metal pressure vessels when metal inner packagings are used. The same is true for UN 1411 and 1928 in packing instruction 409 and this also does not appear to have been taken into account.

1.22.8 Packing Instruction 4X15

AR1: Since glass and earthenware inner packagings have the same reference, the beginning of this additional requirement should read: "Glass, earthenware or plastic inner packagings ...".

1.22.9 Packing Instruction 4X17

The word "For" is completely unnecessary before each of the UN numbers in the listing of inner packagings.

1.22.10 Packing Instruction Y4X1

PP4-6: UN 2257 is for Potassium, which is packing group I; therefore, this UN number appears to be incorrectly shown and needs to be deleted from PP4-6.

PP4-12: given previous comments, it is suggested this PPR should read: "UN 1326, ... and 1871 in packing group II, plastic bags (IP5) are not permitted."

PP4-15: given previous comments, it is suggested this PPR should read: "UN 3208, plastic inner packagings are not permitted."

PP4-16: same comment as for AR1 under packing instruction 4X15.

1.22.11 Packing Instruction 5X1

See the comment under packing instruction 4X17 regarding the use of "For".

AR1: presumably it is intended this be a mandatory requirement. The equivalent text in the current Technical Instructions (Part 4; 7.1.1) says that for organic peroxides packagings must meet packing group II requirements and to avoid unnecessary confinement metal packagings meeting packing group I requirements must not be used. The latter part of this requirement has not been included in packing instruction 5X1;

however, if Part 4, 7.1.1 is being retained, AR1 seems unnecessary. If AR1 is retained, it should read: "Packagings must meet packing group II requirements." If the reference to metal packagings is needed that should be added to it.

PP5-1: it is still a principle of the Technical Instructions that organic peroxides (and self-reactive substances) that need to bear an explosives subsidiary risk label are totally forbidden (ie: forbidden under any circumstance by Part 1; 2.1). If the organic peroxides referred to in this PPR are such substances, PP5-1 should not be included, the packing instructions should not make any reference to them and, if it is possible for them to be consigned, a special provision or other requirement is needed detailing the prohibition; also it should be ensured that Part 4; 7.1.3 is not retained (its inclusion in the reformatted Technical Instructions was an error).

1.22.12 Packing Instruction 5X2

It seems there may be an error in this packing instruction, since in the current Technical Instructions all of the substances listed are not permitted in single packagings on passenger aircraft.

Many of the substances in this packing instruction use the current packing instructions 509 and 517; in those packing instructions a plastic bag (IP 5) needs to be packed in an intermediate packaging. However, this has not been reflected in the new 5X2. The substances are: UN 1442, 1445, 2741, 1449, 1452, 1453, 1748, 1458, 1459, 1461, 3212, 1471, 1472, 1485, 1495, 1496, 1506 and 1513.

AR1: the wording of this AR suggests that the single packagings are made up of a box and a drum; it should be amended to read: "Single packagings which are boxes ... or drums (1D and 1G) must be fitted ...".

PP5-3: the latter part of this PPR should read " ... 1483 in packing group III, fibre inner packagings (IP6) are not permitted."

1.22.13 Packing Instruction 5X3

PP5-2: this PPR should read: "UN 2014, the minimum ullage must be 10%."

UN 2495 has been assigned to this packing instruction. In its current packing instruction 501 it is restricted to glass and metal inner packagings and assigned PPR 8, which restricts metal inner packagings to gas cylinders or other pressure vessels; also 501 does not permit single packagings. These restrictions have not been reflected in packing instruction 5X3.

1.22.14 Packing Instruction Y5XX

At the top of this packing instruction there is a requirement concerning compatibility; presumably this needs to be deleted.

PP5-3: same comment as for packing instruction 5X2.

Many of the substances in this packing instruction use the current packing instructions Y509 and Y517; in those packing instructions a plastic bag (IP 5) needs to be packed in an intermediate packaging. However,

this has not been reflected in the new Y5XX. The substances are: UN 1442, 1445, 2741, 1449, 1452, 1453, 1748, 1458, 1459, 1461, 3212, 1471, 1472, 1485, 1495, 1496, 1506 and 1513.

1.22.15 Packing Instruction Y5XY

Same comment as for packing instruction Y5XX regarding the requirement on compatibility; also same comment regarding PP5-2 as for packing instruction 5X3.

1.22.16 Packing Instruction 6X1

PPR 6: given previous comments this should read: "UN 1888, the quantities permitted in inner packagings must not exceed those for packing group II substances."

1.22.17 Packing Instruction 6X2

UN 1649 and 1694 have been assigned to this packing instruction. In the current Technical Instructions they are assigned to packing instruction 605 and PPR 8; this requires that metal inner packagings be gas cylinders or other metal pressure vessels. This has not been reflected in packing instruction 6X2.

1.22.18 Packing Instruction 6X3

Dashes should not be used in the list of single packagings, they should be replaced with "forbidden".

PPR 2: the first sentence should read as suggested for PPR 6 under packing instruction 6X1.

PPR3: the "no" in the parenthesis in the first sentence should read "not".

PPR4: on the presumption that bags are permitted as inner packagings, the second sentence would read better if reference to "bags" was deleted and a further sentence was added to read as in the last sentence of PPR2.

PPR5: it is believed the second sentence could be better worded to read: "The net mass in inner packagings must not exceed 0.5 kg."

PPR 6: if the PPR only applies to packing group I and II substances, there is no need to refer to these packing groups in the second sentence; and it is confusing in that sentence to refer to certain single packagings in packing group I being prohibited when the last sentence prohibits all single packagings for packing group I. Also, in the first sentence, "no" needs to be changed to "not" in the parenthesis. This PPR would be better if it read: "UN 3146 packing group I and II, only glass, earthenware, plastic or metal (not aluminium) inner packagings are permitted. Single packagings are not permitted for packing group I substances. Aluminium, plywood, fibre and plastic single packagings are not permitted for packing group II substances."

PPR 8: same comment as for PPR 5.

1.22.19 Packing Instruction Y6X1

PPR 6: this PPR would be better worded if it read: "UN 1851 and 1888, the net quantity in inner packagings must not exceed 0.1 L."

1.22.20 Packing Instruction Y6X2

PPR 3: to avoid confusing an aluminium inner packaging (IP3A) with a paper + plastic/aluminium packaging (IP10), this PPR would be clearer if it read: " ... plastic, metal (including aluminium) are permitted."

1.22.21 Packing Instruction 8XX

Since the PPRs refer to the substances by their UN numbers and to be consistent with other packing instructions, it is suggested that in the headings for the listing of inner packagings the UN numbers be used in lieu of the words "Mercury" and "Gallium".

PPR 2: it is unnecessary to refer to "the authorised" packagings, since all the packagings listed are authorised; these words should be deleted. In the current packing instruction 804, it states the dry ice should be around the outer packaging and describes the outer packaging as being "overpacked" in a strong packaging containing the dry ice. In PPR 2, it states that the dry ice may be around the packagings, which suggests it could be around the inner packaging and inside the outer packaging. Moreover, the text is "packagings may be overpacked in ... outer packaging which contains dry ice ...". This text is confusing since outer packaging is a defined term and means the outer of a combination packaging, which would be the packagings listed as such in that packing instruction. If the intention is that the dry ice must be around the inner packaging, the text should make this clear; if the dry ice could be around either the inner packaging or the outer packaging, that also needs to be made clear but the PPR would need rewording to differentiate between dry ice when in a combination packaging and when in a packaging which is an overpack.

1.22.22 Packing Instruction Y8X2

AR1: there seems no reason why this AR has been worded differently to that in packing instruction Y8X1. The version in Y8X1 is the standard used throughout the packing instructions and AR1 in Y8X2 should be amended.

1.22.23 Packing Instruction 9X1

This packing instruction is much better than having individual packing instructions for each group of batteries; however, care needs to be taken to ensure it is realised that the requirements at the top of the packing instruction apply to them all and the individual requirements for each group are additional. For this reason, it is not helpful for the draft in Annex 1 to be divided up by the lines.

1.22.24 Packing Instruction 9X3

PP1: presumably the prohibition only applies when the plastic drums and jerricans are being used a single packagings (ie: 1H2, and 3H2 can be used as outer packagings). If the prohibition relates to potential compatibility problems, there should be a similar prohibition on plastic inner packagings (although in the current Technical Instructions these are permitted, whilst there is the prohibition on single plastic drums and jerricans).

2. COMMENTS ON THE PROPOSED LAYOUTS FOR TABLE 3-1

2.1 The two layouts for Table 3-1 have been studied; ie:

- (1) the draft which is Appendix 2 to WP/51.
- (2) the draft "Annex - Table 3-1 Dangerous Goods List"

As shown both of these are believed to have some problems.

2.2 Regarding (1), it is felt that to show all the packing instructions (for passenger aircraft, cargo aircraft and limited quantities), followed by all the relevant quantity limitations could lead to confusion and the wrong quantity being chosen. It is much better to have the packing instruction and the maximum net quantity per package as close to each other as possible. Also, in this proposed layout, both the special provisions and the new PPRs have been shown in the same column and it is thought this is not very helpful or desirable. For instance, using the present numbering systems, for Amylamine (UN 1106) A3 and PPRY3-1 would be in the same column; for Ammonium picrate, wetted (UN 1310) A40, PP4-1, PP4-2 and PP4-3 would be in the same column. Special provisions have a specific purpose, they have their own chapter in the Technical Instructions and they should be in their own column; it is the same for PPRs; they are in the packing instructions and cannot be found anywhere else. Whilst training will be an important factor in understanding the new layout, it is envisaged that shippers will be looking for "A" numbers in the packing instructions and "PPR" numbers in Part 3, Chapter 3.

2.3 Regarding (2), this layout is much preferred but it is suggested that it is better if the column for the packing group is next to those for the packing instructions. Although it does not show up on the sample page of (2), where there is more than one packing group for the same item of dangerous goods, not having the column for packing group(s) next to those for the packing instructions could lead to confusion. As currently shown in the Technical Instructions, for an item of dangerous goods, all the columns up to and including that for the special provisions apply to the item as a whole (accepting that some special provisions may only apply to certain packing groups); from the packing group column across the rest of the entry, the information is packing group dependent and will remain so, since where there is more than one packing group, even if the packing instruction number is the same, the maximum net quantity per package will differ. With the new packing instructions the packing group still relates to the packing instructions and any special provisions potentially relate to the item in total. Where there are multiple packing groups (eg: see Paint, UN 1263 and special provisions A3 and A72) having the special provision(s) after them could lead users to think they were also related to the packing groups - see further comments below and sample Table 3-1 layout.

2.4 Regarding the layout of a new Table 3-1, some doubt is felt about the need to have PPRs in Table 3-1, despite them being included in the list of dangerous goods in the UN Model Regulations. They are not an essential part of that Table and will only make the line entry for some items appear more cluttered and complex than necessary (especially if there are both special provisions and PPRs). However, with the new packing instructions it not so easy to establish whether a PPR does or does not apply to a specific item and a relevant PPR could be missed. If they are to be shown, having them in the same column with other information is not user-friendly - see comment above for (1); also it is not a good editorial layout to have them in a column in the middle of other columns showing packing instructions and quantity limitations - as with (2). It would be much clearer to put them either before or after the columns covering the packing instructions and quantities per package. Putting them after those columns would maintain a sequence, since the columns provide information in a sequence that identifies the item of dangerous goods, gives any additional essential

information about it and then says how it is to be packed; the user then goes to the packing instruction. PPRs are ancillary information that is needed after a packing instruction has been chosen and not before. Regarding the columns for the packing instructions and quantities per package, the layout in (2) is better. The layout in (1) is unnecessarily repetitive (and would be even more so when an item of dangerous goods has more than one packing group), as well as separating the packing instruction number from the relevant quantity per package. With the exception of the column for PPRs, the layout in (2) is much easier to read and separating the limited quantities columns makes it clear that these are quite different and have their own requirements. It is suggested that if Table 3-1 is to be revised, the sequencing of the columns should be as follows; several examples are shown of how some entries would then appear.

Name	UN no	Class /Div	Sub risk	SPs	PGs	Packing instructions			LQ PI		PPRs	State vars
						No	Max qty		No	Max qty		
							Pax	CAO				
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>
Pesticide, liquid, toxic, flammable, nos * , flash point not less than 23° C	2903	6.1	3	A3 A4 A6	I II III	6X1 6X1 6X1	1 L 5 L 60 L	30 L 60 L 220 L	Forbidden Y6X1 Y6X1	1 L 2 L		
Potassium metal alloys	1420	4.3		A1	I	4X1	Forb	15 kg	Forbidden		PR5 PR6	AU1 CA7 GB3 NL1 US3
Silicon tetrachloride	1818	8			II	8X2	1 L	30 L	Y8X2	0.5 L	PR2 PR3 PR7 PRY2 PRY7	

2.5 The above layout shows the suggested sequence of the columns; it also shows examples of how, it is believed, certain items of dangerous goods should/would appear in the new layout. The columns follow a logical sequence; ie: identification (proper shipping name, UN number, class/division and subsidiary risk); additional information about the item (special provisions); packing group and then the packing information (the permitted packing instructions and related maximum quantity per package), followed by information related to the packing instruction (PPRs); and lastly the State variations. The State variations can only be for information in that they are not part of the mandatory text that ICAO requires to be followed; therefore, they should be placed at the end of the line entry rather than at present, which is in the middle. In neither of the draft layouts for Table 3-1 in (1) and (2) is it apparent what happens if the item of dangerous goods has more than one packing group; the same packing instruction is used but the maximum net quantity per package will vary, which means there will still need to be line entries for each one. The sequencing of the columns is more important in this case, as is demonstrated by the Pesticide entry above; for this item, if columns 5 and 6 were reversed the user could certainly think each special provision related to each packing group alongside which it appears. As can be seen in the above example, the word "Forbidden" has been used when either the item is forbidden on passenger aircraft or when not allowed in limited quantities. In the future for limited quantities

in Table 3-1, care will need to be taken to correctly indicate if an item is actually forbidden or that no provision has been made since it was felt unnecessary. An example of the former is Potassium metal alloys, since packing group I items are not allowed in limited quantities; an example of the latter is Acetaldehyde ammonia (presuming, of course, that it is not forbidden in limited quantities in the UN Model Regulations), which is in class 9 and, under packing instruction 906, is required only to be packed according to the general packing requirements, so limited quantity provisions are deemed unnecessary. For the former, the example above is thought to be how the entry in Table 3-1 should appear and the word "None" should not be used in any of the relevant columns; for the latter it is probably appropriate that "None" is used in the column for the packing instruction and its use explained in Part 3, Chapter 2, with a dash in the column for the maximum net quantity per package. This means, that in (2) in the column for the limited quantities packing instruction number, the word "None" should appear for Acetaldehyde ammonia, with a dash in the quantity column; and the word "Forbidden" should appear across both the columns for limited quantities for Acetone cyanohydrin. If a layout similar to the one shown in (1) is finally used, for Acetaldehyde the word "None" currently in the columns for the quantity per package on passenger aircraft and for limited quantities should be replaced by "Forbidden"; and for Acetaldehyde ammonia, the word "Forbidden" currently in the column for the packing instruction number for limited quantities should be replaced with "None". The example above, shows the particular packing requirements that will apply to Silicon tetrachloride, both when in limited quantities and for other quantities but the way of showing the number takes into account the comments made on the numbering of PPRs in the comments on the proposed packing instructions in Annex 1.

2.6 The example above omits the column for the label which is in the current Table 3-1 in the Technical Instructions. The sequencing of information in the list of dangerous goods means this column appears to be out-of-place and having such a column suggests the information in it will be correct in all circumstances and this is not so. If the label column is removed there will be a number of consequential amendments, particularly in Part 5, Chapter 3 of the Technical Instructions. Part 5;3.1.1, 5;3.2.1, 5;3.2.10 and 5;3.4.1.2 will need amending and it could be argued that the label descriptions in the top left-hand corner of Figures 5-2 to 5-22 are not needed.

2.7 There is a great deal of information contained in the current Table 3-1 and both the layouts in (1) and (2) have more columns. The list of dangerous goods has to remain user-friendly and cramming information together makes it difficult to read and can lead to errors occurring because a line was misread. If additional columns are introduced, it is likely to be at the expense of the column for the proper shipping name. There is a minimum size for this column below which some of the information in it would become unintelligible; and a number of proper shipping names and explanations are so long that if the column was narrower they would take up significantly more space, causing a major extension to the overall length of the table. Some time ago, as part of another exercise, the Secretary of the Dangerous Goods Panel was asked to explore the possibility that Table 3-1 could be published in the Technical Instructions in a landscape format. With the work now being undertaken with the packing instructions, it might be an occasion to again consider which orientation would be the best for the list of dangerous goods.

2.8 On an editorial matter, in both draft layouts, a quantity of ".5 L" is shown; to avoid an inadvertent exceeding of the quantity limitation by the shipper due to missing the point or due to it being missed when the Technical Instructions are printed, the quantity should always be shown as "0.5 L".

2.9 There is an incorrect reference in Part 5;3.2.11(b) of the Technical Instructions, the reference on the first line should be to Part 4;1.1.13.

— END —