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WORKING PAPER

DANGEROUS GOODS PANEL (DGP) WORKING GROUP MEETING (DGP-WG/23)

Rio de Janeiro, Brazil, 15 to 19 May 2023

Agenda Item 10: Harmonization of *Guidance Material for the Dangerous Goods Panel (DGP) to Aid in the Preparation of the Technical Instructions and Supporting Documents* with revised dangerous goods provisions

PROPOSED REVISED EDITION OF GUIDANCE MATERIAL FOR THE DANGEROUS GOODS PANEL

(Presented by Rapporteur, DGP-WG/UN Harmonization)

SUMMARY

This working paper contains the proposed revised edition of the *Guidance Material for the Dangerous Goods Panel (DGP) to Aid in the Preparation of the Technical Instructions and Supporting Documents.*

Action by the DGP-WG is in paragraph 2.

1. INTRODUCTION

1.1 The Guidance Material for the Dangerous Goods Panel (DGP) to Aid in the Preparation of the Technical Instructions and Supporting Documents was initially produced in 1999 to assist the Panel with updating the Technical Instructions. The guidance document contains general principles used in developing the Technical Instructions and guidance material that can be used by the Panel when deciding how to make changes to the Technical Instructions.

1.2 This document however has not been formally updated since 1999 and needs revision. The guidance document also contains policy on the content of the Supplement to the Technical Instructions, which is also now out-of-date. There was a working paper presented at the twenty-eighth meeting of the Dangerous Goods Panel (DGP/28, Virtual, 15 to 19 November 2021) that proposed adoption of a revision to the guidance document, however, questions were raised by some panel members on some aspects of the content of the guidance document and the revised guidance document was not adopted.

1.3 The DGP-WG/UN Harmonization has considered the comments and concerns expressed at DGP/28 and has also reviewed and revised the guidance document to bring it up-to-date to reflect the

decisions taken by the Panel on developing the provisions of the Technical Instructions at DGP/28, such as the addition of packing groups, when applicable, to entries shown in Table 3-1 as "forbidden/forbidden" and the removal of inner packaging "IP" codes for aerosols.

1.4 To address the specific question as to whether there was a need for a review of the guiding principles on the separation of packages of radioactive materials from persons and whether or not they ensure the necessary level of protection for flight crew, the working group developed some additional text that has been added into paragraphs 7.4.1 and 7.4.2. The revised paragraphs include a footnote that refers to IAEA document SSG-26, which provides detailed calculations that were used to develop the separation distances shown in Part 7 of the Technical Instructions.

1.5 The objective behind the guidance document is that it will serve a purpose similar to the *Guiding Principles for the Development of the UN Model Regulations* that was developed, and which is maintained, by the UN Subcommittee of Experts on the Transport of Dangerous Goods.

1.6 The DGP-WG/UN Harmonization has taken the structure and content of the UN guiding principles into account when reviewing and revising the DGP guidance document. The objective being that the Panel guidance document is a useful resource both for existing and future Panel members as a way of preserving the reasons for decisions taken by the Panel on matters of principle regarding the content of the Technical Instructions and the associated Supplement to the Technical Instructions and the Emergency Response Guidance.

1.7 The guidance document attached as an appendix to this working paper reflects the review and revisions proposed by the DGP-WG/ UN Harmonization following DGP/28 for ease of review all changes made since DGP/28 are shown with track changes.

2. ACTION BY THE DGP-WG

2.1 The DGP-WG is invited to consider adoption of the guidance document as Revision 2 to Guidance Material for the Dangerous Goods Panel (DGP) to Aid in the Preparation of the Technical Instructions and Supporting Documents as attached as an appendix to this working paper.

2.2 The DGP-WG is invited to develop a recommendation that at the panel meeting at the conclusion of each biennium, that the guidance material should be updated to include references in the guidance where decisions were taken to deviate from the UN Model Regulations when amending the Technical Instructions or that introduce requirements specific for air transport.

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APPENDIX

GUIDANCE FOR THE PANEL TO AID IN PREPARATION OF THE TECHNICAL INSTRUCTIONS AND SUPPORTING DOCUMENTS

DANGEROUS GOODS PANEL

GUIDANCE FOR THE PANEL TO AID IN PREPARATION OF THE TECHNICAL INSTRUCTIONS AND SUPPORTING DOCUMENTS

ICAO Version 2
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PART 0

INTRODUCTION AND GENERAL PRINCIPLES

0.1 Introduction

0.1.1 This document has been produced to assist the Dangerous Goods Panel (DGP) when updating the Technical Instructions. It contains guidance material and criteria which can be used when deciding how to make changes to those Instructions and other documents, including the Supplement to the Technical Instructions and the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481-AN/928)*.

0.1.2 The general principles used in developing the provisions of the Technical Instructions are to be found in the Foreword to the Technical Instructions. What is contained in this document is the detailed material to aid in the interpretation and application of those general principles.

0.2 Basis for the Technical Instructions

0.2.1 Annex 18 contains the standards and recommended practices for the transport of dangerous goods by air. These are written broadly and without technical detail, in order that amendment to them is required only infrequently. The Technical Instructions contain all the detailed material; they are amended at regular intervals on a cycle commensurate with the cycle of amendment applied to the updating of the UN *Recommendations on the Transport of Dangerous Goods* (Model Regulations).

0.2.2 The UN *Recommendations on the Transport of Dangerous Goods* are acknowledged as the "model regulations" on which the modes of transport should base their requirements. The Technical Instructions follow, as far as possible, both the format and content of the UN Model Regulations. The UN Model Regulations contain all the provisions applicable to the transport of radioactive materials, notwithstanding that these are published in a standalone set of regulations by the IAEA. This means that, although the requirements for radioactive materials will be those of the IAEA, their method of inclusion in the Instructions will be the same as in the UN Model Regulations. The UN Model Regulations and the IAEA Regulations have been developed to cover all modes of transport and may, therefore, contain some requirements that are inappropriate for air transport. This has to be taken into account when deciding how to incorporate changes made to the UN Model Regulations as they may not be applicable or may have to be modified before being included in the Technical Instructions.

0.2.3 The Air Navigation Commission[1] requires the Panel to use the UN Model Regulations, which are prepared by the UN Subcommittee of Experts, and which incorporate the International Atomic Energy Agency (IAEA) Regulations for the Safe Transport of Radioactive Material as the base document for the development and updating of the Technical Instructions. This ensures there is compatibility of the basic requirements between all the modes of transport (i.e. air, road, rail and sea), so that shippers can have

[1] The Air Navigation Commission (ANC) considers and recommends Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS) for adoption or approval by the ICAO Council. The ANC is tasked by the Council to manage the technical work programme of ICAO and, since its establishment, the Commission has considered and recommended SARPs comprising 17 out of the 19 Annexes to the Chicago Convention, including Annex 18 and the Technical Instructions. The DGP reports to the ANC.

a co-ordinated approach to consigning dangerous goods no matter which modes are involved and also avoid problems when it is necessary to transfer goods between those modes.

0.2.4 Amendments to the Technical Instructions are also made to reflect changes in the operational aspects of handling dangerous goods in air transport; and requirements may be developed which recognize that additional conditions need to be imposed for particular dangerous goods.

0.3 Differences between the UN Model Regulations and the Technical Instructions

0.3.1 Whilst the Technical Instructions follow closely the UN Model Regulations, there are some requirements in the Model Regulations which have no application in air transport, or which the Panel has deemed to be inappropriate for air transport. When this occurs, the Panel can decide the requirement does not need be included in the Instructions. Significant differences are specifically identified in this guidance document together with the Panel's basis for deviating from the provisions of the UN Model Regulations.

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PART 1

GENERAL

1.1 Structure of the Technical Instructions

1.1.1 The Technical Instructions consist of eight parts, with each part being divided into chapters and each chapter divided into paragraphs and subparagraphs. Following the eight parts there are a number of attachments. The attachments do not form part of legal text of the Technical Instructions and are provided for information.

1.1.2 Within each chapter, the chapter number is incorporated into all of the paragraph numbers; thus, in Chapter 3, paragraph 2 carries the number "3.2". When referring to a paragraph, it is necessary to identify the appropriate part; if the above example were located in Part 2, the reference to it would be shown as "2;3.2" (that is, Part 2; Chapter 3, paragraph 3.2).

1.1.3 As an exception, and to maintain a correspondence between the class number and the chapter number in Part 2, the first chapter, "Introduction", of Part 2 is not assigned to "Chapter 1" as applies in all other parts in the Technical Instructions. Instead, the first chapter is designated "Introductory Chapter". The numbering of the paragraphs within this chapter are therefore not prefaced with the chapter number.

1.1.4 Figures and tables are numbered sequentially within the part in which they appear. Thus, the second figure appearing in Part 4 is identified as "Figure 4-2" and the first table appearing in Part 3 is identified as "Table 3-1".

1.2 Scope and applicability

1.2.1 General Applicability

1.2.1.1 The provisions of the Technical Instructions detail the requirements applicable to the international transport of dangerous goods by air. However, it is recognized that there will be circumstances where there is a justifiable need for dangerous goods to be transported other than as normally provided for in the Technical Instructions.

1.2.1.2 To make provision for this to happen the Technical Instructions make allowance for dangerous goods to be transported under an "approval" or an "exemption" granted by the authority(ies) of the State(s) concerned.

a) An "approval" may be granted when it is specifically provided for in the Technical Instructions. Areas where approvals may be granted include:

1) An approval may be granted by the authorities of the State of Origin[2] and the State of the Operator, provided an overall level of safety equivalent to that provided for in the Technical Instructions is achieved, for dangerous goods shown as "forbidden" for carriage on a passenger aircraft or on both a passenger aircraft and cargo aircraft only in Part 3, Dangerous Goods List (Table 3-1) of the Technical Instructions but that have Special Provision A1 or A2 assigned:

[2] The "State of Origin" is the State in the territory in which the consignment is first to be loaded onto an aircraft.

— by the appropriate national authority of the State of manufacture for the classification of explosives and unlisted organic peroxides as detailed in Part 2 — Classification.

— by the appropriate national authority of the State of Origin for the use of a packaging alternative to those shown in the applicable packing instruction as detailed in Part 4 — Packing Instructions.

b) An "exemption" may be granted by the States concerned[3] provided that in such instances every effort is made to achieve an overall level of safety which is at least equivalent to the level of safety provided for in the Technical Instructions. An exemption may be considered in instances:

1) of extreme urgency;

2) when other forms of transport are inappropriate; or

3) when full compliance with the prescribed requirements is contrary to public interest.

1.2.1.3 Further detail of the conditions for issue of approvals and exemptions is contained in the Supplement to the Technical Instructions, see Part S-1;1 in the Supplement. Guidance on the content of the Supplement is set out in Section 10 of this document.

1.2.1.4 Included in "General Applicability" are specific allowances that have been developed by the Panel that except from the provisions of the Technical Instructions dangerous goods carried on an aircraft where these dangerous goods are required for defined purposes. These include, but are not limited to, dangerous goods carried:

a) to provide, during flight, medical aid to a patient;

b) to provide, during flight, veterinary aid or a humane killer for an animal;

c) for dropping in connection with agricultural, horticultural, forestry, ice jam and landslide clearance or pollution control activities; and

d) to provide, during flight, or related to a flight aid in connection with search and rescue operations.

[3] *"States concerned" are the States of Origin, Operator, Transit, Overflight and Destination.*

1.3 Limitation of dangerous goods on aircraft

1.3.1 Exceptions for dangerous goods of the operator

The Technical Instructions provide for certain dangerous goods to be carried on an aircraft and provides exceptions for when the provisions of the Instructions do not apply. This allowance addresses dangerous goods which are:

a) items of dangerous goods which are required on board an aircraft for operational / airworthiness reasons, such as oxygen cylinders, oxygen generators and fire extinguishers;

b) dangerous goods carried in the cabin for sale or use by the operator, e.g. duty free goods for sale such as perfumes and aerosols;

c) alcohol-based hand sanitizers which may be carried on board the aircraft for passenger and crew use;

d) dry ice required as part of food and beverage service;

e) articles containing lithium batteries used on board the aircraft, such as laptop computers on the flight deck and portable electronic devices (PED) provided for passenger use.

1.4 Definitions

1.4.1 Where a definition is needed in the Annex and/or the Technical Instructions and it already appears in another ICAO Annex, the Air Navigation Commission will expect that definition to be used. This is for consistency.

1.4.2 Where a definition appears in the UN Model Regulations it is included in the Technical Instructions providing it is applicable and it does not conflict with any definition already used in another ICAO Annex; in which case it will be necessary to resolve any conflict before it is added to the Technical Instructions.

1.4.3 The definitions from the UN Model Regulations have all been included into Part 1;3.1, although some, such as “Bundles of cylinders”, “Multiple-element gas containers (MEGCs)”, “Pressure drums”, “Remanufactureed large packaging”, “Reused large packaging”, and “Salvage pressure receptacles” have been annotated “(Not permitted for air transport)” as the Panel has determined that these items are inappropriate for air transport as the net quantity of dangerous goods that these packagings are capable of containing is far in excess of that permitted by the Technical Instructions.

1.4.4 Defintion of “cargo”. At the 22nd meeting of DGP (DGP/22) the Panel agreed to adopt a definition for “cargo” that was specific to the Technical Instructions and which deviated from the definition of “cargo” in Annex 9 — *Facilitation*. The panel identified the need to ensure that the definition of “cargo” also included “stores”, such that when stores (company materials or COMAT) classified as dangerous goods, were being shipped it was clear that “stores” are “cargo” and are subject to all of the relevant provisions of the Technical Instructions, including those set out in Part 7 — Operator’s Responsibilities.

1.4.5 Definition of “shipper”. There is no definition of shipper in either Annex 18 or the Technical Instructions. In past Panel discussions it has been decided that any definition could result in a loophole and preference has been given to relying on what has become the accepted meaning, which is that it is a synonym for “consignor”. Whilst the term “shipper” is used in most of the requirements, in those paragraphs where it is necessary to more specifically identify the relevant person or organisation the wording used is "person who offers ...".

1.4.6 Any term used in the Technical Instructions which may not be understood can be defined. However, where a term has its usual dictionary meaning or is used in its usual technical sense it is not further defined.

1.5 Training

1.5.1 The requirements for dangerous goods training set out in Part 1;4 of the Technical Instructions are based on Chapter 1.3 in the UN Model Regulations. However, provisions in the Technical Instructions were revised with effect the 2021-2022 edition to refer to the application of a competency-based training and assessment programme for dangerous goods training. Specific guidance was developed to address competency-based training and assessment, which is contained in a separate ICAO publication (*Guidance on a Competency-based Approach to Dangerous Goods Training and Assessment* (Doc 10147*)*).

1.5.2 With a view to expanding the detection of undeclared dangerous goods in cargo and dangerous goods not permitted in passenger baggage, the Panel included a requirement that dangerous goods training must also apply to personnel engaged in security screening of cargo, mail and passenger baggage as these persons may detect dangerous goods not permitted.

1.5.3 In addition to dangerous goods training for entities involved in the transport of dangerous goods as cargo, DGP determined that dangerous goods training should also be mandated for staff of designated postal operators (DPO) as detailed and that dangerous goods training programmes of DPO be subject to review and approval by the civil aviation authority of the State where the mail was accepted by the DPO.

1.5.3.1 The requirements specifying dangerous goods training for staff of DPO was introduced into the Technical Instructions in the 2013-2014 edition to address concerns on incidents involving dangerous goods in international airmail as well as the expansion of dangerous goods permitted in mail to include small lithium batteries contained in equipment, where the DPO was specifically approved by their civil aviation authority to permit acceptance of mail containing such articles.

1.5.4 Provisions for the dangerous goods training also exist in Annex 6 – Operation of Aircraft for flight crew, cabin crew and other applicable personnel of the operator and in the Aviation Security Manual for security screening personnel as follows:

Annex/SARP/Document	Reference	Comments
Annex 6 — Operation of aircraft, Part I	9.3.1 e)	Training for flight crew
Annex 6 — Operation of aircraft, Part I	12.4 e)	Training for cabin crew. Note 12.4 mandates annual training.
Annex 6 — Operation of aircraft, Part I	14.2 a)	Training for operators with no specific approval for the transport of dangerous goods as cargo.

Annex/SARP/Document	Reference	Comments
Annex 6 — Operation of aircraft, Part I	14.3 a)	Training for operators with a specific approval for the transport of dangerous goods as cargo. Note, refers to Table 1-4.
Annex 6 — Operation of aircraft, Part I	Attachment J, 4.1	Operator's training programme. Note, refers to Table 1-4 and Table 1-5
Annex 17 — Security	Attachment — Extracts from the Technical Instructions	Note, the extract includes out-of-date material from Part 1;4
Security Manual	8.3.6.10 k)	General statement of training for security staff and staff involved in screening procedures.
Security Manual	8.3.6.14 d) iii)	General statement of training for security supervisors at screening checkpoints.
Security Manual	8.3.6.17	Description of dangerous goods training programme for screeners. Note, refers to Table 1-4.

1.5.5 The panel should ensure that as changes may be made to Annex 18 or the Technical Instructions related to dangerous goods training, the Flight Operations Panel (FLTOPSP) and the Aviation Security Panel (AVSECP) are made aware so that alignment with the Technical Instructions is maintained.

1.6 Dangerous goods security

1.6.1 Provisions relating to dangerous goods security that reflect the content of the UN Model Regulations were adopted into the Technical Instructions with effect the 2005-2006 edition.

1.6.2 In adopting the provisions from the UN Model Regulations DGP considered the merit of including security provisions into the Technical Instructions vs. recommendation that AVSECP adopts the security provisions for dangerous goods into Annex 17 and the associated *Aviation Security Manual* (Doc. 8973). As there was some pressure to adopt the UN provisions into air transport to ensure a consistent application across the modes and AVSECP was not in a position to adopt the dangerous goods security provisions, DGP agreed to incorporate the dangerous goods security provisions into the Technical Instructions.

1.6.3 However, as the national authority responsible for air transport is often not the national authority for transport security the dangerous goods security provisions in the Technical Instructions have only been included as recommendations and not as mandatory requirements, i.e. "should" and not "must".

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PART 2

CLASSIFICATION

2.1 General

2.1.1 The classification provisions of Part 2 are in almost complete alignment with those of the UN Model Regulations to ensure modal harmonisation. Some classification provisions though have not been incorporated into Part 2 of the Technical Instructions as the content is seen as being specialist in use and not specific to air transport. The provisions not currently incorporated or adopted are:

2.1.1.1 Class 1 Explosives. Much of the content of the UN Model Regulations on the classification of explosives, including the default classification table for fireworks has not been incorporated in the Technical Instructions. Classification of explosives in a State is typically performed or overseen by a specialist agency for explosives and apply across all modes of transport. Additionally, most explosives are forbidden in air transport. Reference is made in the Technical Instructions to the concerned paragraphs of the UN Model Regulations.

2.1.1.2 Class 3 Flammable Liquids. The UN Model Regulations in paragraph 2.3.2.5 permits viscous substances with a flash point of 23°C or above to be considered "not subject to the Regulations" provided the solvent separation and flowtime in the viscosity test meet specified requirements. This provision has not been adopted into the Technical Instructions as the Panel has determined that it is not appropriate to exclude these substances from the Technical Instructions as these viscous substances still pose a significant flammability hazard.

2.1.1.3 Self-reactive substances that require temperature control are forbidden in air transport unless exempted and are listed as such in Table 3-1, Dangerous Goods List. Therefore, Paragraph 2.4.2.3.5.4 of the UN Model Regulations that refers to conditions for diluents for substances that require temperature control has not been adopted. Self-reactive substances solid and liquid of type B are forbidden by air under any circumstances as these have explosive properties and would require the addition of an explosive subsidiary hazard label. These substances have not been assigned the appropriate UN number in Table 2-6 but are listed as FORBIDDEN.

2.1.1.4 Organic Peroxides that require temperature control are forbidden in air transport and are listed as such in Table 3-1 Dangerous Goods List. Organic Peroxides of Type B are forbidden by air under any circumstances as these have explosive properties and would require the addition of an explosive subsidiary hazard label. These substances have not been assigned the appropriate UN number in "Table 2-7 List of currently assigned organic peroxides in packagings" but are listed as FORBIDDEN.

2.1.1.5 The organic peroxides listed in Table 2-7 reflect those shown in the table associated with paragraph 2.5.3.2.4 in the UN Model Regulations. This paragraph identifies that formulations not listed in the table but that are listed in packing instruction IBC520 are also permitted in accordance with packing method OP8 of packing instruction P520 in the Model Regulations. For this reason, Table 2-7 in the Technical Instructions also includes organic peroxides that are permitted in packing instruction IBC520, but that are not included in the table in paragraph 2.5.3.2.4 of the UN Model Regulations.

2.1.1.6 Classification of environmentally hazardous substances. The extensive classification criteria for environmentally hazardous substances have not been incorporated in the ICAO Technical Instructions but reference is made to the classification criteria in 2.9.3 of the UN Model Regulations and to the criteria of international and national regulations established by the appropriate national authorities in

the State of Origin, transit or destination of the consignment Although these substances may pose no major risk for air transport, in order to facilitate multimodal transport of these substances the classification criteria have been aligned with the UN Model Regulations.

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PART 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS, LIMITED QUANTITY AND EXCEPTED QUANTITY PROVISIONS

3.1 Dangerous goods list

3.1.1 The Dangerous Goods List, Table 3-1, in the Technical Instructions reflects the list of UN numbers contained in the UN recommendations. The content of Table 3-1 is to a large extent based on the Table included in the UN Model Regulations. The list is shown in alphabetical order, although this is not the order used for the list in the UN Model Regulations as it is felt that shippers would search primarily by the proper shipping name and not by the UN number.

3.1.2 Generic and "not otherwise specified" (n.o.s.) proper shipping names in Table 3-1 that must be supplemented with the technical or chemical group name are identified by the addition of the star "★" symbol following the proper shipping name. This is applied in lieu of the assignment of Special Provision 274, which is the method used in the UN Model Regulations to identify this requirement.

3.1.3 Table 3-1 in the Technical Instructions, in addition to containing entries with a UN number also includes many entries that:

a) serve as a cross-reference to a UN entry;

b) identify the substance as being forbidden under any circumstances;

c) identify the substance as being not restricted for transport.

3.1.4 Where an article or substance is considered as specific to air transport, the Subcommittee may decline to allocate a UN number. In such instances the DGP can decide to allocate an identification "ID" number. At the current time there is only one "ID" number item listed, being ID 8000, **Consumer commodity**. To facilitate multi-modal transport, the Panel assigned ID 8000, Consumer commodity to a limited quantity packing instruction. In this way, although not directly aligned to the UN Model Regulations, ID 8000 can move across all modes of transport as ID 8000 is assigned to a limited quantity "Y" packing instruction. The air mode limited quantity mark is recognized as identification that the goods comply with the surface modes limited quantity provisions.

3.1.5 For items which are forbidden for air transport on both passenger aircraft and cargo aircraft, only the following information is provided:

a) Proper shipping name

b) UN number

c) Class or division number

d) Subsidiary hazard class or division number(s), if applicable

e) State variations, if applicable

f) Packing group, if applicable

g) Special provisions, if applicable

3.1.6 For dangerous goods which are “forbidden under any circumstances” in air transport and which therefore are not permitted to be transported under an exemption or approval, only the proper shipping name in light type is shown in the dangerous goods list and the indication “FORBIDDEN” is applied across columns 2 and 3. The UN number and class or division are not shown.

3.2 Quantity limitations for the dangerous goods list

3.2.1 The dangerous goods list in the UN Model Regulations does not specifiy the net quantity permitted for the UN number and packing group, when applicable. Rather the UN list simply identifies the alphanumeric code assigned to the packing instructions. The packing instructions indicate the packaging permitted, which may include large packagings (LP), intermediate bulk containers (IBC).

3.2.2 The Technical Instructions has very specific net quantity per package limits for the entries in Table 3-1for passenger and cargo aircraft (column 11) and Cargo Aircraft Only (column 13) for the UN number and each packing group, where applicable. The quantities shown in Table 3-1 in the Technical Instructions are applied according to the criteria shown in Table 1 to Table 3 below. The Panel may, based on the chemical characteristics of a specific substance or group of substances or article, determine that quantities other than those in Table 1 or Table 2 may be assigned. An example of this is chlorosilanes which, because of their hazard characteristics, are restricted to cargo aircraft only.

3.2.3 Where the article or substance does not have a subsidiary hazard, the maximum net quantity per package is according to Table 1 below; where the article or substance has one or more subsidiary hazards, Table 2 sets out the maximum net quantity per package.

3.2.4 Columns 10 and 11 of Table 3-1 in the Technical Instructions also show the packing instruction number and maximum net quantity applicable to limited quantities, when permitted; the assigned maximum net quantity per package for dangerous goods in limited quantity are shown in Table 3. Limited quantity packing instructions are identified by the “Y” prefix. More information on dangerous goods permitted as limited quantity is set out in paragraph 3.4.

3.2.5 The criteria used when adding self-reactive substances and organic peroxides to the dangerous goods list are as follows:

a) Self-reactive substances and organic peroxides and either permitted on both passenger and cargo aircraft or forbidden on both types (ie: there are no organic peroxides or self-reactive substances which should be forbidden on passenger aircraft but permitted on cargo aircraft in normal circumstances).

b) The self-reactive substances and organic peroxides which are forbidden are:

   1) those requiring temperature control (forbidden unless shipped under exemption);

   2) those of type B (forbidden under any circumstances).

   For more explanation see also 2.1.1.3 and 2.1.1.4 of this guidance document.

c) The UN Model Regulations identify the packing method for self-reactive substances and organic peroxides in the lists with the currently assigned self-reactive substances and organic peroxides. These packing methods are identified by use of a “OP” code

from OP1 to OP8. Tables 2-6 and 2-7 in the Technical instructions are the equivalent of these lists but do not contain these packing methods. Even if the UN OP method permits larger quantities, the maximum net quantities per package or self-reactive substances and organic peroxides are restricted in Table 3-1 in the Technical Instructions to:

Type	***Physical state***	***Passenger aircraft***	***Cargo aircraft***
C and D	Liquid	5 L	10 L
	Solid	5 kg	10 kg
E and F	Liquid	10 L	25 L
	Solid	10 kg	25 kg

3.2.6 The 19th revised edition of the UN Model Regulations adopted classification criteria, generic entries in the Dangerous Goods List for "polymerizing substances" as well as special provision that was assigned to listed entries for substances that may polymerize in transport. As with self-reactive substances of division 4.1 and organic peroxides, polymerizing substances requiring temperature control are forbidden in air transport unless shipped under exemption.

3.2.7 Recognizing that a shipper may wish to pack different dangerous goods in the same outer packaging for a combination packaging, the Panel developed a method that would ensure that where the shipper packs multiple different dangerous goods in the same outer packaging, the total net quantity of all the dangerous goods in the package would not exceed the equivalent of that permitted by the values shown in columns 11 and 13. The method of doing this is to apply the ratio of the actual net quantity against the permitted net quantity for each dangerous goods where the sum of the ratios must not exceed "1". This is called the "Q" value. The calculated "Q" value must be included on the dangerous goods transport document.

3.3 Packing instructions in the dangerous goods list

3.3.1 Columns 10 and 12 identify the packing instruction assigned to the UN number and packing group, when applicable. The first number of the packing instruction indicates the class to which the substance is assigned. The detail on the assignment of the packing instruction numbers is set out in paragraphs 4.1.1 to 4.1.4.

Table 1. Maximum net quantities per package for dangerous goods with no subsidiary hazard (see 3.2.1 and 3.2.2 for explanation)

Class/ Division	Packing group	Physical state	Passenger aircraft	Cargo aircraft
1	2	3	4	5
DIVISIONS 1.1 TO 1.3 — EXPLOSIVES				
1.1			Forbidden (Forbidden)	Forbidden (Forbidden)
1.2			Forbidden (Forbidden)	Forbidden (Forbidden)
1.3 *(Note 1)*			Forbidden (Forbidden)	Forbidden (Forbidden) 75 kg
DIVISION 1.4 — EXPLOSIVES				
1.4B			Forbidden (Forbidden)	75 kg
1.4C			Forbidden (Forbidden)	75 kg
1.4D			Forbidden (Forbidden)	75 kg
1.4E			Forbidden (Forbidden)	75 kg
1.4F			Forbidden (Forbidden)	Forbidden (Forbidden)
1.4G			Forbidden (Forbidden)	75 kg
1.4S			25 kg	100 kg
DIVISIONS 1.5 AND 1.6 — EXPLOSIVES				
1.5D			Forbidden (Forbidden)	Forbidden (Forbidden)
1.6N			Forbidden (Forbidden)	Forbidden (Forbidden)
CLASS 2 — GASES				
2.1		Gases, not aerosols	Forbidden (5 kg)	150 kg (150 kg)
		Aerosols	75 kg	150 kg
		Chemicals under pressure	Forbidden	75 kg
		Refrigerated liquefied gases	Forbidden	Forbidden

Class/ Division	Packing group	Physical state	Passenger aircraft	Cargo aircraft
1	**2**	**3**	**4**	**5**
2.2		Gases, not aerosols and not refrigerated liquefied gases	75 kg	150 kg
		Aerosols	75 kg	150 kg
		Refrigerated liquefied gas	50 kg	500 kg
		Chemicals under pressure	75 kg	150 kg
2.3		Gases	Forbidden *(Note 2)*	Forbidden *(Note 2)*
CLASS 3 — FLAMMABLE LIQUID				
3	I	Liquid	1 L	30 L
	II	Liquid	5 L *(Note 3)*	60 L *(Note 3)*
	III	Liquid	60 L	220 L
DIVISION 4.1 — FLAMMABLE SOLID				
4.1	II	Solid, but not self-reactive substances	15 kg *(Note 3)*	50 kg *(Note 3)*
	III	Solid, but not self-reactive or related substances	25 kg	100 kg
	—	Desensitized explosives	0.5 kg / 1 kg *(Note 4)*	0.5 kg / 15 kg *(Note 4)*
	—	Self-reactive liquid *(Note 5)*	5 L / 10 L *(Note 6)*	10 L / 25 L *(Note 6)*
	—	Self-reactive solid *(Note 5)*	5 kg / 10 kg *(Note 6)*	10 kg / 25 kg *(Note 6)*
	—	Self-reactive or related substance temperature controlled	Forbidden (Individual consideration)	Forbidden (Individual consideration)
	III	Polymerizing liquid, stabilized	10 L	25 L
	III	Polymerizing solid, stabilized	10 kg	25 kg
	—	Polymerizing substance, temperature controlled	Forbidden	Forbidden

Class/ Division	Packing group	Physical state	Passenger aircraft	Cargo aircraft
1	**2**	**3**	**4**	**5**
DIVISION 4.2 — SPONTANEOUSLY COMBUSTIBLE SUBSTANCES				
4.2	I	Pyrophoric liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		Pyrophoric solid	Forbidden (Forbidden)	Forbidden (Forbidden)
	II	Liquid	1 L	5 L
		Solid	15 kg *(Note 3)*	50 kg *(Note 3)*
	III	Liquid	5 L	60 L
		Solid	25 kg *(Note 3)*	100 kg *(Note 3)*
DIVISION 4.3 — WATER REACTIVE SUBSTANCES				
4.3	I	Liquid	Forbidden (Forbidden)	1 L
		Solid	Forbidden (Forbidden)	15 kg
	II	Liquid	1 L	5 L
		Solid	15 kg	50 kg
	III	Liquid	5 L	60 L
		Solid	25 kg	100 kg
DIVISION 5.1 — OXIDIZERS				
5.1	I	Liquid	Forbidden (Forbidden)	2.5 L
		Solid	1 kg	15 kg
	II	Liquid	1 L	5 L
		Solid	5 kg	25 kg
	III	Liquid	2.5 L	30 L
		Solid	25 kg	100 kg
DIVISION 5.2 — ORGANIC PEROXIDES				
5.2		Liquid *(Note 5)*	5 L / 10 L *(Note 6)*	10 L / 25 L *(Note 6)*
		Solid *(Note 5)*	5 kg / 10 kg *(Note 6)*	10 kg / 25 kg *(Note 6)*

Class/ Division	Packing group	Physical state	Passenger aircraft	Cargo aircraft
1	**2**	**3**	**4**	**5**
DIVISION 6.1 — TOXIC SUBSTANCES				
6.1(i)	I	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		Solid	Forbidden (Forbidden)	15 kg
6.1(d and o)	I	Liquid	1 L	30 L
		Solid	5 kg *(Note 3)*	50 kg *(Note 3)*
6.1	II	Liquid	5 L *(Note 3)*	60 L *(Note 3)*
		Solid	25 kg	100 kg *(Note 3)*
	III	Liquid	60 L	220 L
		Solid	100 kg	200 kg
DIVISION 6.2 — INFECTIOUS SUBSTANCES				
6.2		Liquid	50 mL	4 L
		Solid	50 g	4 kg
CLASS 8 — CORROSIVE SUBSTANCES				
8	I	Liquid	0.5 L	2.5 L
		Solid	1 kg	25 kg
	II	Liquid	1 L *(Note 3)*	30 L
		Solid	15 kg	50 kg
	III	Liquid	5 L	60 L
		Solid	25 kg	100 kg
CLASS 9 — MISCELLANEOUS DANGEROUS GOODS				
9			Quantities vary according to individual items *(Note 7 and 8)*	Quantities vary according to individual items *(Note 7 and 8)*

Notes for Table 1

1. Some articles in Division 1.3 are permitted on cargo aircraft, when the articles are for life-saving purposes (e.g. Flares, aerial, UN 0093).

2. The quantity permitted will always be according to Packing Instruction 210 in the Supplement [Note: possibly to become PI 200 in the Supplement].

3. Reduced quantities apply to specific substances such as chlorosilanes, nitroglycerin solution in alcohol and nitrocellulose. Substances for which specific quantity limits or packaging types apply are assigned to non-standard packing instructions are identified in Table 4. This table identifies the packing instructions assigned to each class/division by packing group, if applicable, for passenger aircraft and cargo aircraft only.

4. Quantity varies depending on the sensitivity of the explosive form.

5. Forbidden self-reactive substances and organic peroxides, see 3.2.4 (b) above.

6. See paragraph 3.2.4 above.

7. Not all dangerous goods in Class 9 are permitted in air transport. Those forbidden are UN 2212, UN 2216, ~~UN 3256,~~ UN 3257, UN 3258, UN 3359, UN 3509, UN 3536 and UN 3548 (note, permitted by Special Provision A224 with limitations).

8. The panel agreed with effect the 2011-2012 Instructions to permit solid environmentally hazardous substances (UN 3077) only, to be shipped in intermediate bulk containers (IBC) up to a maximum net quantity of 1 000 kg. This decision resulted from the fact that solid environmentally hazardous substances present minimal risk in air transport.

Table 2. Maximum net quantities per package for dangerous goods with one or more subsidiary hazard (see 3.2.1 and 3.2.2 for explanation)

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	PG	(Note 1)			
1	2	3	4	5	6
CLASS 1 — EXPLOSIVES					
1.1		6.1		Forbidden (Forbidden)	Forbidden (Forbidden)
		8		Forbidden (Forbidden)	Forbidden (Forbidden)
1.2		6.1		Forbidden (Forbidden)	Forbidden (Forbidden)
		8		Forbidden (Forbidden)	Forbidden (Forbidden)
1.3		6.1		Forbidden (Forbidden)	Forbidden (Forbidden)
		8		Forbidden (Forbidden)	Forbidden (Forbidden)
1.4B		6.1		Forbidden (Forbidden)	75 kg
		8		Forbidden (Forbidden)	75 kg
1.4C		6.1		Forbidden (Forbidden)	75 kg
		8		Forbidden (Forbidden)	75 kg
1.4D		6.1		Forbidden (Forbidden)	75 kg
		8		Forbidden (Forbidden)	75 kg
1.4E		6.1		Forbidden (Forbidden)	75 kg
		8		Forbidden (Forbidden)	75 kg
1.4F		6.1		Forbidden (Forbidden)	Forbidden (Forbidden)
		8		Forbidden (Forbidden)	Forbidden (Forbidden)
1.4G		6.1		Forbidden (Forbidden)	75 kg
		8		Forbidden (Forbidden)	75 kg
1.4S		6.1		25 kg	100 kg
		8		25 kg	100 kg

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
1.5D		6.1		Forbidden (Forbidden)	Forbidden (Forbidden)
		8		Forbidden (Forbidden)	Forbidden (Forbidden)
1.6N		6.1		Forbidden (Forbidden)	Forbidden (Forbidden)
		8		Forbidden (Forbidden)	Forbidden (Forbidden)
DIVISION 2.1 — FLAMMABLE GASES					
2.1		6.1, 8	Gases, not aerosols	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1 I or II	Aerosols	Forbidden (Forbidden)	Forbidden (Forbidden)
		8 I or II	Aerosols	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1 III	Aerosols	75 kg	150 kg
		8 III	Aerosols	75 kg	150 kg
		6.1	Chemicals~~~~ under pressure	~~[~~Forbidden (~~? kg~~ Forbidden)~~]~~	~~[~~75 kg~~]~~
		8	Chemicals~~~~ under pressure	~~[~~Forbidden (~~? kg~~ Forbidden)	~~[~~75 kg~~]~~
DIVISION 2.2 — NON-FLAMMABLE, NON-TOXIC GASES					
2.2		5.1	Gases, not aerosols *(Note 2)*	75 kg	150 kg
		6.1	Gases, not aerosols *(Note 2)*	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		8	Gases, not aerosols *(Note 2)*	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1 I or II	Aerosols	Forbidden (Forbidden)	Forbidden (Forbidden)
		8 I or II	Aerosols	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1 III	Aerosols	75 kg	150 kg
		8 III	Aerosols	75 kg	150 kg
		6.1	Chemicals~~~~ under pressure	~~[~~Forbidden (~~? kg~~ Forbidden)	~~[75~~100 kg~~]~~

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
		8	Chemicals under pressure	Forbidden~~[1 kg]~~ (Forbidden)	~~[150~~100 kg~~]~~
DIVISION 2.3 — TOXIC GASES					
2.3		2.1		Forbidden *(Note 3)*	Forbidden *(Note 3)*
		5.1		Forbidden *(Note 3)*	Forbidden *(Note 3)*
		8		Forbidden *(Note 3)*	Forbidden *(Note 3)*
CLASS 3 — FLAMMABLE LIQUID					
3	I	4.3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		5.1	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	Forbidden (Forbidden)	30 L
		8	Liquid	0.5 L	2.5 L
	II	4.3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		5.1	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	1 L	60 L
		8	Liquid	1 L (Note 4)	5 L
	III	4.3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		5.1	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	60 L	220 L
		8	Liquid	5 L	60 L

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
DIVISION 4.1 — FLAMMABLE SOLID					
4.1		4.2	Desensitized explosive	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		4.3	Desensitized explosive	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		5.1	Desensitized explosive	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Desensitized explosive	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		8	Desensitized explosive	Forbidden (Individual consideration)	Forbidden (Individual consideration)
	II	5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	15 kg	50 kg
		8	Solid	15 kg	50 kg
	III	5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	25 kg	100 kg
		8	Solid	25 kg	100 kg
DIVISION 4.2 — SPONTANEOUSLY COMBUSTIBLE SUBSTANCES					
4.2	I	3	Pyrophoric liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.3	Pyrophoric liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		5.1	Pyrophoric liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Pyrophoric liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		8	Pyrophoric liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		3	Pyrophoric solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.3	Pyrophoric solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		5.1	Pyrophoric solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Pyrophoric solid	Forbidden (Forbidden)	Forbidden (Forbidden)

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
		8	Pyrophoric solid	Forbidden (Forbidden)	Forbidden (Forbidden)
	II	3	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.3	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		5.1	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Liquid	1 L	5 L
		8	Liquid	1 L	5 L
		4.1	Solid	5 kg	15 kg
		5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	15 kg	50 kg
		8	Solid	15 kg	50 kg
	III	4.3	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		5.1	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Liquid	5 L	60 L
		8	Liquid	5 L	60 L
		4.1	Solid	15 kg	50 kg
		4.3	Solid	25 kg	100 kg
		5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	25 kg	100 kg
		8	Solid	25 kg	100 kg
DIVISION 4.3 — WATER REACTIVE SUBSTANCES					
4.3	I	3	Liquid	Forbidden (Individual consideration)	[1 L])
		5.1	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	Forbidden (Forbidden)	1 L
		8	Liquid	Forbidden (Forbidden)	1 L
		4.1	Solid	Forbidden (Forbidden)	15 kg

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	PG	(Note 1)			
1	2	3	4	5	6
		4.2	Solid	Forbidden (Forbidden)	15 kg
		5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	Forbidden (Forbidden)	15 kg
		8	Solid	Forbidden (Forbidden)	15 kg
4.3	II	3	Liquid	Forbidden (Individual consideration ~~[1 L]~~)	~~[~~5~~1~~ L~~]~~
		5.1	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	1 L	5 L
		8	Liquid	1 L (Note 4)	5 L
		4.1	Solid	15 kg	50 kg
		4.2	Solid	15 kg	50 kg
		5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	15 kg	50 kg
		8	Solid	15 kg	50 kg
	III	3	Liquid	Forbidden (Individual consideration ~~[5 L]~~)	~~[~~60~~5~~ L~~]~~
		5.1	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	5 L	60 L
		8	Liquid	5 L	60 L
		4.1	Solid	25 kg	100 kg
		4.2	Solid	25 kg	100 kg
		5.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	25 kg	100 kg
		8	Solid	25 kg	100 kg

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
DIVISION 5.1 — OXIDIZERS					
5.1	I	3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		4.3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	Forbidden (Forbidden)	2.5 L
		8	Liquid	Forbidden (Forbidden)	2.5 L
		4.1	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.2	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.3	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	1 kg	15 kg
		8	Solid	1 kg	15 kg
	II	3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		4.3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	1 L	5 L
		8	Liquid	1 L	5 L
		4.2	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.3	Solid	Forbidden (Forbidden)	Forbidden (Forbidden)
		6.1	Solid	5 kg	25 kg
		8	Solid	5 kg	25 kg
	III	3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		4.3	Liquid	Forbidden (Individual consideration)	Forbidden (Individual consideration)
		6.1	Liquid	2.5 L	30 L
		8	Liquid	2.5 L	30 L
		6.1	Solid	25 kg	100 kg
		8	Solid	25 kg	100 kg

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
DIVISION 6.1 — TOXIC SUBSTANCES					
6.1(i)	I	3	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.2	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.3	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		5.1	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		8	Liquid	Forbidden (Forbidden)	Forbidden (Forbidden)
		4.1	Solid	Forbidden (Forbidden)	15 kg
		4.2	Solid	Forbidden (Forbidden)	15 kg
		4.3	Solid	Forbidden (Forbidden)	15 kg
		5.1	Solid	Forbidden (Forbidden)	15 kg
		8	Solid	Forbidden (Forbidden)	15 kg
6.1(d and o)	I	3	Liquid	1 L	30 L
		4.3	Liquid	Forbidden (Forbidden)	1 L
		5.1	Liquid	Forbidden (Forbidden)	2.5 L
		8	Liquid	0.5 L	2.5 L
		4.1	Solid	1 kg	15 kg
		4.2	Solid	5 kg	15 kg
		4.3	Solid	5 kg	15 kg
		5.1	Solid	1 kg	15 kg
		8	Solid	1 kg	25 kg
6.1	II	3	Liquid	5 L	60 L
		4.3	Liquid	1 L	5 L
		5.1	Liquid	1 L	5 L
		8	Liquid	1 L (Note 4)	30 L
		4.1	Solid	15 kg	50 kg
		4.2	Solid	15 kg	50 kg

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	PG	(Note 1)			
1	2	3	4	5	6
		4.3	Solid	15 kg	50 kg
		5.1	Solid	5 kg	25 kg
		8	Solid	15 kg	50 kg
6.1	III	3	Liquid	60 L	220 L
CLASS 8 — CORROSIVES SUBSTANCES					
	I	3	Liquid	0.5 L	2.5 L
		4.2	Liquid	0.5 L	2.5 L
		4.3	Liquid	Forbidden (Forbidden)	1 L
		5.1	Liquid	Forbidden (Forbidden)	2.5 L
		6.1	Liquid	0.5 L	2.5 L
		4.1	Solid	1 kg	25 kg
		4.2	Solid	1 kg	25 kg
		4.3	Solid	1 kg	25 kg
		5.1	Solid	1 kg	25 kg
		6.1	Solid	1 kg	25 kg
8	II	3	Liquid	1 L (Note 4)	30 L
		4.2	Liquid	1 L	30 L
		4.3	Liquid	1 L	30 L
		5.1	Liquid	1 L	30 L
		6.1	Liquid	1 L	30 L
		4.1	Solid	15 kg	50 kg
		4.2	Solid	15 kg	50 kg
		4.3	Solid	15 kg	50 kg
		5.1	Solid	15 kg	50 kg
		6.1	Solid	15 kg	50 kg
	III	6.1	Liquid	5 L	60 L

Primary hazard		Subsidiary hazard(s)	Physical state	Passenger aircraft	Cargo aircraft
Class/Div	**PG**	(Note 1)			
1	**2**	**3**	**4**	**5**	**6**
		6.1	Solid	25 kg	100 kg

Notes for Table 2

1. Subsidiary hazard(s) in classes/divisions other than those shown are not possible. In case substances are forbidden in the Techncial Instructions and there is more than one subsidiary hazard for a particular Class/Division and Packing Group (eg: Class 3 PG II, with subsidiary hazards 6.1 and 8) individual consideration needs to be given as to the quantities which would be appropriate or whether a total or partial prohibition is warranted.

2. Refrigerated liquefied gases with a subsidiary hazard are either forbidden on passenger aircraft or on passenger and on a cargo aircraft.

3. The quantity permitted will always be according to Packing Instruction 210 in the Supplement [Note: possibly to become PI 200 in the Supplement].

4. Reduced quantities apply to specific substances such as chlorosilanes. Substances for which specific quantity limits or packaging types apply are assigned to non-standard packing instructions are identified in Table 4.

Table 3. Maximum net quantities per package for dangerous goods in limited quantities

Class/ Division	Packing group	Physical state	Inner packaging	Per package
1	2	3	4	5
CLASS 1 — EXPLOSIVES				
Not permitted in limited quantity.				
CLASS 2 — GASES				
2.1		UN 1950 and UN 2037 without subsidiary hazard, UN 3478 and UN 3479 only	120 mL *(Note 1)*	UN 1950 30 kg gross mass applies only UN 2037, 1 kg UN 3478, UN 3479, 0.5 kg
2.2		UN 1950 and UN 2037 without subsidiary hazard	120 mL *(Note 1)*	UN 1950 30 kg Gross mass applies only UN 2037, 1 kg
CLASS 3 — FLAMMABLE LIQUID				
3	II	Liquid	500 mL	1 L
	III	Liquid	5 L	10 L
		UN 3316 (Polyester resin kit)	30 mL / 100 g	1 kg
		UN 3473 (Fuel cell cartridges)	2.5 kg	2.5 kg
CLASS 4 — FLAMMABLE SOLIDS AND WATER REACTIVE SUBSTANCES				
4.1	II	Flammable solids only	500 g	5 kg
	III	Flammable solids only	1 kg	10 kg
4.3	II	Solid	500 g	5 kg
	III	Solid	1 kg	10 kg
CLASS 5 — OXIDIZERS AND ORGANIC PEROXIDES				
5.1	II	Liquid	100 mL	500 mL
		Solid	500 g	2.5 kg
	III	Liquid	500 mL	1 L
		Solid	1 kg	10 kg
5.2 *(Note 2)*		Liquid	30 mL	500 mL
		Solid	100 g	1 kg

Class/ Division	Packing group	Physical state	Inner packaging	Per package
1	2	3	4	5
CLASS 6 — TOXIC SUBSTANCES				
6.1	II	Liquid	100 mL	1 L
		Solid	500 g	1 kg
	III	Liquid	500 mL	2 L
		Solid	1 kg	10 kg
CLASS 8 — CORROSIVE SUBSTANCES				
8	II	Liquid	100 mL	500 mL
		Solid	500 g	5 kg
	III	Liquid	500 mL	1 L
		Solid	1 kg	5 kg
CLASS 9 — MISCELLANEOUS DANGEROUS GOODS				
9		UN 2071 (Ammonium nitrate fertilizers)	5 kg	30 kg gross mass applies only
		UN 1990 (Benzaldehyde) UN 1941 (Dibromo-difluoromethane) UN 3082 (Environmentally hazardous substance, liquid) UN 3334 (Aviation regulated liquid)	5 L	30 kg gross mass applies only
		UN 3077 (Environmentally hazardous substance, solid) UN 3335 (Aviation regulated solid)	5 kg	30 kg gross mass applies only
		ID 8000 (Consumer commodity)	500 mL for liquids 500 g for solids Aerosols no limit (*Note 1*)	30 kg gross mass applies only

Notes for Table 3

1. Metal aerosols and metal receptacles containing gas (gas cartridges) containing only non-toxic substance(s), may be up to 1 L. Non-refillable plastic aerosols must not exceed 120 mL capacity, except when the propellant is a non-flammable, non- toxic gas and the contents are not dangerous goods, in which case the quantity must not exceed 500 mL

2. Restricted to those organic peroxides contained in a chemical kit or first aid kit.

3.4 Special provisions

3.4.1 Special provisions are included in the Technical Instructions and Supplement when it is appropriate to adopt the equivalent special provision from the UN Model Regulations, or that are developed by the Panel for specific use in air transport. In some instances, the special provision from the UN Model Regulations may be modified to align to the requirements of air transport. The special provisions shown in the Technical Instructions are prefixed by "A", primarily to differentiate them from those shown in the UN Model Regulations. The special provisions which are the same as those in the UN Model Regulations have the UN special provision number shown in parentheses following the special provision "A" number allocated in the Technical Instructions.

3.4.2 The sequence of numbering the special provisions is that numbers A1 to A299 are reserved for the Technical Instructions; A300 and onwards are used in the Supplement. Where an item of dangerous goods appears in the lists of both the Technical Instructions and the Supplement any special provisions assigned to it have numbers allocated from the sequence in the Technical Instructions (unless there is an additional requirement that applies only to the item as listed in the Supplement) and they are not renumbered from the sequence used in the Supplement. It is where a special provision needs only to be shown in the list in the Supplement that a number in the A300 sequence is allocated. Where a special provision number is cancelled, for whatever reason, the wording "not used" will be added to that particular special provision number in order not to renumber the whole list.

3.4.3 Special Provision A1 is assigned to certain substances or articles which are forbidden on passenger aircraft for a specific reason, but which are in principle, based on their classification and packing group assignment in accordance with these guiding principles, permitted for transport on a passenger aircraft, (see Table 1 and Table 2).

3.4.4 Special Provision. A2 is assigned to substances or articles which are forbidden on passenger aircraft and on cargo aircraft for a specific reason, but which are in principle, based on their classification and packing group assignment in accordance with these guiding principles, permitted for transport on cargo aircraft only, (see Table 1 and Table 2). Special Provision A2 is also assigned to all Division 2.3 gases without or with a subsidiary hazard (with the exception of UN1071, UN 3168 and UN 3169 which are permitted on cargo aircraft only). Special Provision A2 is sometimes also assigned to substances where it is felt that these will generally not be transported by air such as Articles containing dangerous goods, n.o.s., Hay, Seed cake and Copra.

3.4.5 Certain special provisions allow the substances or articles to be excepted from the provisions of the Technical Instructions and shipped as non-dangerous goods (not restricted). Where the shipper must perform certain actions, as described in the special provision, for the substance or article to be offered for air transport as "not restricted", the special provision will identify that the shipper must include a statement on the air waybill, when one is used. The statement on the air waybill must include the words "not restricted" and the special provision number.

3.4.6 Typically special provisions are used to:

a) address specific classification considerations, such as those that may result in the substance or article no longer being subject to the Technical Instructions. For these special provisions the requirement for the statement on the air waybill does not apply;

b) identify that for the entry a net quantity in excess of that normally permitted is allowed, or based on properties limit the net quantity below that normally permitted.

c) based on specific conditions permits the transport of the substance or article even though normally forbidden.

3.5 Limited quantities

3.5.1 The Technical Instructions contain provisions for limited quantities of dangerous goods. These recognize that many dangerous goods when in reasonably limited quantities present a reduced hazard during transport and can safely be carried in good quality packagings of the types specified in the Technical Instructions, but which have not been tested and marked according to the requirements of Part 6.

3.5.2 The requirements for limited quantities are based on those in the UN Model Regulations but there are major differences. Only those substances permitted in limited quantities in the UN Model Regulations ~~are considered as being suitable for limited quanties in air transport with only those~~ and permitted for transport on a passenger aircraft are ~~allowed in~~considered as being suitable for limited quantities in air transport and are assigned a limited quantity packing instruction in Table 3-1.

3.5.3 In the UN Model Regulations, packages of limited quantities need not be labelled and need not be marked with the proper shipping name and UN number. In the Technical Instructions, packages containing limited quantities are not excluded from these requirements; the relaxation in the Instructions is the ability for the packaging not to be tested and marked as a UN specification packaging, although the packaging must meet the construction standards applicable to the type. Packages of limited quantities packed in conformity with the Technical Instructions are acceptable for transport by other modes under their limited quantity provisions.

3.5.4 The UN Model Regulations specify the net quantity permitted in each inner packaging and the gross mass of the completed package must not exceed 30 kg, but do not set limits for maximum net quantity per package. The Technical Instructions include ~~requirements for~~ maximum net quantities per package except for UN 1941, UN 1950, UN 1990, UN 2071, UN 3077, UN 3082, UN 3334, UN 3335 and ID 8000 where the gross mass of the completed package must not exceed 30 kg. In the UN Model Regulations, the quantities permitted in inner packagings of limited quantities may sometimes be the same as the maximum net quantity per package specified in the Technical Instructions for the particular item in UN specification packaging (e.g. for Acetyl chloride, UN 1717 the UN Model Regulations allow 1 L per inner packaging for limited quantities; in the Technical Instructions this is the maximum net quantity per package for UN specification packaging on passenger aircraft). The maximum net quantity per inner packaging and the maximum net quantity per package that is permitted as limited quantity for each class and division is shown in Table 3.

3.5.5 For dangerous goods in limited quantities the Technical Instructions maintain the requirements in Part 5 of the Technical Instructions for marking, labelling and documentation, which are not required for limited quantities in the UN Model Regulations. The basis for this to ensure that dangerous goods in limited quantity, as for all other packages of dangerous goods bearing a hazard label, are subject to all applicable provisions set out in Part 7 — Operator's Responsibilities in the Technical Instructions and that dangerous goods are only carried as cargo by operators that hold a specific authorisation from their national authority as described in Annex 6 — *Operation of Aircraft, Part I – International Commercial Air Transport – Aeroplanes*, Chapter 14 — Dangerous Goods.

3.6 Excepted quantities

3.6.1 The rationale behind the excepted quantitiy provisions is that selected dangerous goods, other than articles, packed in very small quantities with limitations on the quantity per inner packaging and outer packaging in very robust tested packagings pose a minimal hazard in transport than do the same

dangerous goods in larger quantities. On this basis the Panel developed provisions for "dangerous goods in excepted quantities" that were adopted into the Technical Instructions.

3.6.2 Packages containing dangerous goods in excepted quantities are not required to bear hazard labels; there is no requirement for the marking of the UN number and proper shipping name and no requirement for a dangerous goods transport document. Such packages though are required to bear the excepted quantities mark, which must include identification of the primary hazard class(es)/division(s) of the dangerous goods contained in the package.

3.6.3 Table 3-1 in the Technical Instructions identifies if dangerous goods are permitted in excepted quantities by indication of the applicable excepted quantities code shown in column 9. If dangerous goods which are allowed for air transport on passenger and cargo aircraft or on cargo aircraft only, are not permitted under the provisions for dangerous goods in excepted quantities, the Code E0 will be assigned. When the substance is forbidden for air transport, column 9 of Table 3-1 in the Technical Instructions will be left blank, which is in alignment with standard format for Table 3-1 in that also no packing instructions for limited quantities and UN packing instructions are provided. The net quantity per inner packaging and per package that apply to the excepted quantities codes are found in Table 3-3 of the Technical Instructions.

3.6.4 Only substances permitted on passenger aircraft are permitted to be shipped as dangerous goods in excepted quantities. The assignment of classes and divisions to the excepted quantities codes are shown in Table 4, below.

Table 4. Assignment of class/division to excepted quantities codes

Class / Division	Packing Group I EQ Code	Packing Group II EQ Code	Packing Group III EQ Code
1	E0 (not permitted)		
2.1	E0 (not permitted)		
2.2 (without subsidiary hazard) (note 1)	E1		
2.2 (with subsidiary hazard)	E0 (not permitted)		
2.3	E0 (not permitted)		
3 (without subsidiary hazard) (note 2)	E3	E2	E1
3 (with subsidiary hazard)	E0 (not permitted)	E2	E1
4.1 (note 3)	E0 (not permitted)	E2	E1
4.2	E0 (not permitted)	E2	E1
4.3 (note 4)	E0 (not permitted)	E2	E1
5.1	E0 (not permitted)	E2	E1
5.2	E0 (not permitted)		
6.1 (note 5)	E5	E4	E1
6.2	E0 (not permitted)		
7	E0 (not permitted)		
8 (note 6)	E0 (not permitted)	E2	E1
9 (note 7)		E2	E1

Notes for Table 4

1. UN 1043, UN 1044, UN 1950, UN 2037, UN 2857, UN 3164, UN 3500 and UN 3511 are excluded from the provisions of excepted quantities.

2. UN 1204, UN 2059 and UN 3473 are excluded from the provisions of excepted quantities.

3. UN 2555, UN 2556, UN 2557 and UN 2907 are excluded from the provisions of excepted quantities.

4. UN 3292 and UN 3476 are excluded from the provisions of excepted quantities.

5. Substances of division 6.1 with an inhalation toxicity of Packing Group I are not permitted under the provisions of excepted quantities.

6. UN 1774, UN 2794, UN 2795, UN 2800, UN 2803, UN 2809, UN 3028, UN 3477 and UN 3506 are excluded from the provisions of excepted quantities.

7. Articles of class 9 are excluded from the provisions of excepted quantities and also UN 1845 Dry Ice and UN 3245 Genetically modified (micro) organisms.

3.6.5 The UN Model Regulations include within the provisions for dangerous goods in excepted quantities allowance for what are described in the Technical Instructions as “de minimis quantities”. The extract from the UN “Guiding Principles for the Development of the UN Model Regulations describes de minimis quantities as follows:

> “Excepted quantities of dangerous goods assigned to codes E1, E2, E4, and E5 are not subject to the Model Regulations in quantities often referred to as "de minimis". The rationale behind "de minimis" quantity provisions is that selected dangerous goods packed in minute quantities, with limitations on the quantity per inner packaging and outer packaging and in good quality packaging pose a negligible risk in transport compared to those same goods packed in larger quantities. On this basis relief from all other provisions of the Model Regulations is accepted. Subjecting minute quantities of certain goods to the full requirements of the Model Regulations is of questionable value, and may also falsely communicate a risk in transport. This in turn can lead to unjustified precautions and unnecessary incident response actions which are unwarranted and have a negative effect on transport safety. To ensure consistency with the excepted quantity provisions, only dangerous goods assigned to excepted quantity codes E1, E2, E4, and E5 qualify for “de minimis” provisions:

E-Code	**Maximum quantity per inner receptacle**	**Maximum quantity per package**
E1, E2, E4 and E5	1 mL (liquids and gases) 1 g (solids)	100 mL (liquids and gases) 100 g (solids)

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PART 4

PACKING INSTRUCTIONS

4.1 Introduction

4.1.1 In general dangerous goods are packed according to the requirements of the UN Model Regulations and the packagings are those which are permitted in the UN Model Regulations. However, specialised items may mean the development of packing methods which recognise that for air transport more stringent (or different) requirements are needed.

4.1.2 Except for packing instructions for Class 1, some packing instructions for Class 2, and for Division 6.2, the packing instructions in the Technical Instructions do not however follow the structure used by the UN Model Regulations. The Panel determined that to the extent possible, packing instructions for substances permitted on passenger aircraft and those permitted only on cargo aircraft should be separated. Packing instructions for limited quantities are identified by the prefix "Y". The numbers assigned to packing instructions commence with the class number of the substance or article. Within a class, separate packing instructions apply to divisions within the class.

4.1.3 Substances are assigned to a packing instruction based on the packing group and any subsidiary hazard(s) that may warrant specific consideration. The majority of substances are assigned to a "standard" packing instruction applicable to the class or division, aircraft type and packing group. Specific packing instructions developed for substances or articles that require more stringent packaging options or that have extensive special conditions are listed following the standard packing instructions in each class or division, as applicable.

4.1.4 For Class 9 the packing instructions for substances or articles have been developed to group like substances and articles requiring similar packing considerations. Limited quantity packing instructions have been developed for some substances in Class 9 where the substance is permitted in limited quantity according to the UN Model Regulations.

4.1.5 Table 5 of the guidance document shows the current assignment of the packing instructions and identifies:

a) the class or division of the substances or articles assigned to the packing instruction, and for specific packing instructions, the group of substances or UN number(s), as applicable;

b) any subsidiary hazard(s);

c) type of inner packagings permitted;

d) net quantity per inner packaging;

e) net quantity per package; and

f) other considerations, such as whether single packagings are permitted or more restrictive packaging requirements apply.

4.1.6 The reformatted packing instructions that became effective with the 2011 – 2012 edition of the Technical Instructions adopted a consistent application of requirements across all classes / divisions as follows:

General Requirements

Metal packagings must be corrosion resistant or protected against corrosion for substances with a Class 8 primary or subsidiary hazard;

Specific Requirements

Packing Group I

For liquid dangerous goods, inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

Class Specific Requirements

Class 3

For Packing Group I substances plastic inner packagings are forbidden as most plastics tend to become electrostatically charged. This creates a risk of **electrostatic discharges** which are capable of igniting flammable atmospheres. As a result, a flash fire hazard exists even when relatively small plastic containers are used.

4.2 Packagings

4.2.1 Dangerous goods are almost always required to be packed in packagings; where an article may be shipped unpackaged this is shown in the packing instruction.

4.3 Portable tanks

4.3.1 Portable tanks can be used also for dangerous goods in packing groups II and III of Classes 3, 8 and 9 and Divisions 4.1 (other than self-reactive substances), 4.3 (other than liquids), 5.1 (other than liquids) and 6.1. These tanks are restricted to cargo aircraft and need the approval of the appropriate authority of the State of origin and of the State of the operator; the complete requirements are currently shown in Part S-4, Chapter 12 of the Supplement.

4.4 Intermediate bulk containers

4.4.1 The use of intermediate bulk containers (IBC) is currently only permitted for solid environmentally hazardous substances.

4.5 Large Packagings

4.5.1 Large packagings can be used for certain dangerous goods and are only permitted only for the transport of articles on cargo aircraft. and need the approval of the appropriate authority of the State of origin and of the State of the operator. The complete requirements are currently shown in Part S-4, Chapter 13 of the Supplement.

4.6 Standard of inner packagings

4.6.1 Generally the UN Model Regulations do not make reference to inner packagings and there are no construction standards for them. Inner packaging construction standards for use in air transport have been developed by the Panel over the years and the types of packagings identified are those which experience has shown are used by shippers. With the exception of the need to demonstrate the ability to withstand a pressure differential (see 4.7 below), there are no independent tests applied to inner packagings; the tests are those applicable to the complete package "as prepared for transport".

4.7 Ability of packagings to withstand a pressure differential

4.7.1 In almost all large commercial aircraft, the fuselage, including the cargo compartments, is pressurised to maintain an internal pressure equivalent to an altitude between 6,000 ft and 8,000 ft even though the aircraft may cruise at an altitude in excess of 38,000 ft. Recognising that in the rare event of a sudden depressurisation packagings will be at 38,000 ft, the Panel determined that packagings intended to contain liquids must have the ability to withstand a pressure differential of 95 kPa or a pressure related to the vapour pressure, if this is greater; for Packing Group III liquids in Class 3, ~~and~~ Division 6.1 and Class 9, the pressure differential need only be 75 kPa. This applies to any packaging which is intended to contain a liquid and includes the inner packagings as well as single and composite packagings.

4.8 Requirement for some substances to be in more stringent packagings

4.8.1 Some substances which are assigned to Packing Group III are considered to present a particular hazard on an aircraft, such that in the event of leakage, they can cause irreversible damage to the aluminium structure or react readily with the atmosphere to produce flammable gases or some other uncontrollable event. For these substances, the Panel has determined that packagings meeting the Packing Group III performance requirements do not provide a suffient safety factor and a higher standard of packaging is required.

4.8.2 Dangerous goods which have the possibility of causing such damage or reaction are, therefore, required to be in packagings which meet at least Packing Group II standards. In particular, this applies to Class 8 (corrosives) in Packing Group III, where many of them have corrosivity to metal as their main hazard; and Class 4 (flammable solids, spontaneously combustible substances and water reactive substances) in Packing Group III, where many of them are extremely reactive with moist air.

4.8.3 There are currently two items of dangerous goods which are assigned to Packing Group III but which are required to be in Packing Group I packagings. These are Gallium (UN 2803) and Mercury (UN 2809). The primary hazard posed by these substances in the event of leakage is the ability to embrittle or otherwise irreversibly damage aluminium within a few minutes. The standard of packaging reflects the need to ensure adequate containment of these particular substances.

4.9 Packing instructions for explosives

4.9.1 The packing instructions for explosives and their numbers are the same as those used in the UN Model Regulations although the packing instructions from the UN Model Regulations that apply to explosives forbidden in air transport are not included in the Technical Instructions but are included in the Supplement.

4.10 Packing instructions for self-reactive substances and organic peroxides

4.10.1 The UN Model Regulations identify the packing method for self-reactive substances and organic peroxides in the lists with the currently assigned self-reactive substances and organic peroxides. These packing methods are identified by use of a "OP" code from OP1 to OP8. Tables 2-6 and 2-7 in the Technical ~~i~~Instructions are the equivalent of these lists but do not contain these packing methods. Even where the applicable OP packing method in Packing Instruction P520 in the UN Model Regulations permits larger quantities, the inner packaging quantities in Packing instruction 459 for self-reactive sunstances and Packing instruction 520 for organic peroxides are restricted to:

Type	Physical state	Passenger aircraft	Cargo aircraft
C and D	Liquid	0.5 L	1 L
	Solid	0.5 kg	1 kg
E and F	Liquid	1 L	2.5 L
	Solid	1 kg	2.5 kg

4.10.2 The allowed packagings in ~~p~~Packing ~~i~~Instructions 459 and 520 of the Technical Instructions conform to the applicable OP method shown in UN packing instruction P520 of the Model Regulations; but even if the UN OP method permits other types of packagings, those allowed in the Technical Instructions are restricted as follows:

a) only combination packagings are permitted;

b) only plastic inner packagings are permitted;

c) metal outer packagings are not permitted; outer packagings are restricted to boxes of fibreboard, plywood, solid plastic or wood, drums of fibre, plastic and plywood or plastic jerricans.

Metals may contain impurities and can accelerate decomposition and lead to dangerous situations, and hence metal inner and outer packagings are not permitted.

4.11 Articles permitted unpackaged

4.11.1 Certain articles, typically large robust explosive articles and batteries are authorized by the Technical Instructions or the Supplement to be offered for transport unpackaged, on pallets or packed in crates or other outer protective enclosures such as fully enclosed or wooden slatted crates. Such configurations are typically authorized when packagings described in Part 6 of the Technical Instructions are impractical due to the size, shape, or mass of the article.

Table 5. Packing instruction assignment

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 1						
101	Assigned to n.o.s. explosive entries in Division 1.4C, 1.4D, 1.4E, 1.4G and 1.4S. Requires approval by the appropriate national authority					UN P101
114	Assigned to substances in Division 1.4C					UN P114
130	Assigned to articles in Division 1.3C, 1.3G, 1.4C, 1.4D, 1.4E, 1.4G and 1.4S					UN P130
131	Assigned to detonators, Division 1.4B and 1,4S					UN P131
133	Assigned to articles in Division 1.4B, 1.4G and 1.4S					UN P133
134	Assigned to articles in Division 1.3C, 1.4C and 1.4S					UN P134
135	Assigned to articles in Division 1.3G, 1.4G and 1.4S					UN P135
136	Assigned to Cases, cartridge and Cases, combustible in Division 1.4C and 1.4S					UN P136
137	Assigned to Charges, explosive, commercial and Charges shaped in Division 1.4D and 1.4S					UN P137
138	Assigned to UN 0237, Charges, shaped, flexible, linear in Division 1.4D					UN P138
139	Assigned to Cord, detonating and Fuse, detonating in Division 1.4D					UN P139
140	Assigned to Cord, igniter, Fuse, igniter and Fuse, safety in Division 1.4G and 1.4S					UN P140
141	Assigned to Fuzes, detonating, Fuzes, igniter and Grenades, practice in Division 1.4B, 1.4D, 1.4G and 1.4S					UN P141
142	Assigned to Igniters and Lighters, fuse in Division 1.4G and 1.4S					UN P142
143	Assigned to UN 0491, Charges, propelling in Division 1.4C					UN P143
CLASS 2						
200	Assigned to entries for compressed, liquefied and dissolved gases in Divisions 2.1 and 2.2					Closely aligned to UN P200.
201	UN 1057 and UN 3150 in Division 2.1					
202	Assigned to entries for refrigerated, liquefied gases in Division 2.2					UN P203
203	UN 1950, Aerosols amd UN 2037, Gas cartridges (Receptacles, small, containing gas)					Packagings must meet PG II requirements
Y203	UN 1950, Aerosols amd UN 2037, Gas cartridges (Receptacles, small, containing gas)					
206	UN 3167, UN 3168 and UN 3169, gas sample, non-pressurized, n.o.s.					Closely aligned to UN P201 Packagings must meet PG II requirements
208	UN 3164, Articles pressurized, hydraulic and pneumatic					
211	UN 2857, Refrigerating machines					
213	UN 1044, Fire extinguishers					
214	UN 3468, Hydrogen in a metal hydride storage system or contained in or packed with equipment					Items 1 to 7 from UN P205

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
215	UN 3478 and UN 3479, Fuel cell cartridges				1 kg pax / 15 kg CAO	Derived from UN P004 packagings must meet PG II requirements
Y215	UN 3478 and UN 3479, Fuel cell cartridges				0.5 kg	
216	UN 3478 and UN 3479, Fuel cell cartridges contained in equipment				1 kg pax/ 15 kg CAO	Derived from UN P004
217	UN 3478 and UN 3479, Fuel cell cartridges packed with equipment				1 kg pax/ 15 kg CAO	Derived from UN P004
218	UN 3500, UN 3501, UN 3502, UN 3503, UN 3504 and UN 3505, Chemicals under pressure					Closely aligned to UN P206
219	UN 3510, UN 3511 and UN 3513, Adsorbed gases					Closely aligned to UN P208
220	UN 3529, Engine or machinery flammable gas powered				No limit	
222	UN 3538, Articles containing non-flammable, non-toxic gas, n.o.s. (restricted to articles containing Div. 2.2 gases with no subsidiary hazard, see SP A225)				75 kg gas pax/ 150 kg gas CAO	Based on UN P006
CLASS 3						
LIMITED QUANTITY						
Y340	II	8	Glass	0.5 L	0.5 L	
			Plastic	0.5 L		
			Metal	0.5 L		
Y341	II	6.1 and none	Glass	0.5 L	1.0 L	
			Plastic	0.5 L		
			Metal	0.5 L		
Y342	III	8	Glass	1.0 L	1.0 L	
			Plastic	1.0 L		
			Metal	1.0 L		
Y343	III	6.1	Glass	1.0 L	2.0 L	
			Plastic	1.0 L		
			Metal	1.0 L		
Y344	III	None	Glass	2.5 L	10.0 L	
			Plastic	10.0 L		
			Metal	10.0 L		
CLASS 3						
PASSENGER AIRCRAFT						
350	I	8	Glass	0.5 L	0.5 L	
			Plastic	Forbidden		
			Metal	0.5 L		
351	I	None	Glass	0.5 L	1.0 L	
			Plastic	Forbidden		
			Metal	1.0 L		
352	II		Glass	1.0 L	1.0 L	

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
		8, 6.1, 6.1 + 8, and none	Plastic	1.0 L		
			Metal	1.0 L		
353	II	None	Glass	1.0 L	5.0 L	
			Plastic	5.0 L		
			Metal	5.0 L		
354	III	8	Glass	2.5 L	5.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	5.0 L		
			Metal	5.0 L		
355	III	6.1 and none	Glass	2.5 L	60.0 L	single packagings permitted
			Plastic	10.0 L		
			Metal	10.0 L		
CLASS 3						
CARGO AIRCRAFT						
360	I	8, 6.1 + 8 and none	Glass	1.0 L	2.5 L	single packagings permitted
			Plastic	Forbidden		
			Metal	2.5 L		
361	I	6.1 and none	Glass	1.0 L	30.0 L	single packagings permitted
			Plastic	Forbidden		
			Metal	5.0 L		
362	II	8	Glass	1.0 L	5.0 L	single packagings permitted
			Plastic	1.0 L		
			Metal	1.0 L		
363	II	8, 6.1 + 8,	Glass	2.5 L	5.0 L	single packagings permitted
			Plastic	2.5 L		
			Metal	5.0 L		
364	II	6.1 and none	Glass	2.5 L	60.0 L	single packagings permitted
			Plastic	5.0 L		
			Metal	10.0 L		
365	III	8	Glass	5.0 L	60.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	10.0 L		
			Metal	25.0 L		
366	III	6.1 and none	Glass	5.0 L	220.0 L	— single packagings permitted
			Plastic	10.0 L		
			Metal	25.0 L		
CLASS 3						
SPECIALS						
370	UN 3269, Polyester resin kits				5 kg	Aligned to UN P302
Y370	UN 3269, Polyester resin kits				1 kg	
371			Glass	1.0 L		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
	UN 1204, Nitroglycerin solution in alcohol		Plastic	1.0 L	5.0 L Pax / 60.0L CAO	
			Metal	1.0 L		
	UN 3064, Nitroglycerin solution in alcohol		Metal	1.0 L	5.0 L CAO	
372	UN 3165, Aircraft hydraulic power unit fuel tank				42.0 L CAO	Identical to UN P301
373 UN 1228 Mercaptans, flammable, toxic	II	6.1	Glass	5.0 L	Forbidden pax 60.0 L CAO	single packagings permitted for CAO
			Plastic	5.0 L		
			Metal	5.0 L		
	III	6.1	Glass	1.0 L	5.0 L pax	
			Plastic	1.0 L		
			Metal	1.0 L		
	III	6.1	Glass	5.0 L	220.0 L CAO	
			Plastic	5.0 L		
			Metal	5.0 L		
Y373 UN 1228 Mercaptans, flammable, toxic	III	6.1	Glass	0.5 L	1.0 L	
			Plastic	0.5 L		
			Metal	0.5 L		
374	UN 3473, Fuel cell cartridges				5 kg pax	Derived from UN P004 packagings must meet PG II requirements
					50 kg CAO	
Y374	UN 3473, Fuel cell cartridges				2.5 kg	
375	UN 3473, Fuel cell cartridges contained in equipment				5.0 kg pax	Derived from UN P004
					50.0 kg CAO	
376	UN 3473, Fuel cell cartridges packed with equipment				5.0 kg pax	Derived from UN P004
					50.0 kg CAO	
377 Chlorosilanes	II		Glass	1 L	5 L CAO	single packagings permitted for CAO
			Plastic	Forbidden		
			Metal	5 L		
378	UN 3528 Engine / Machinery, flammable liquid powered and Engine / Machinery fuel cell, flammable liquid powered				No limit	
CLASS 4						
DIVISION 4.1						
LTD QTY						
Y440	II	6.1	Glass	0.5 kg	1.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
Y441	II	8 and none	Glass	0.5 kg	5.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
			Plastic bag	0.5 kg		
Y442	III	8 and none	Glass	1.0 kg	5.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
Y443	III	6.1 and none	Glass	1.0 kg	10.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
CLASS 4						
DIVISION 4.1						
PASSENGER SOLID						
445	II	6.1, 8, and none	Glass	1.0 kg	15.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Plastic bag	1.0 kg		
446	III	6.1, 8, and none	Glass	1.0 kg	25.0 kg	packagings must meet PG II requirements
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Plastic bag	1.0 kg		
CLASS 4						
DIVISION 4.1						
CARGO SOLID						
448	II	6.1, 8, and none	Glass	2.5 kg	50.0 kg	single packagings permitted
			Plastic	5.0 kg		
			Metal	5.0 kg		
			Plastic bag	2.5 kg		
449	III	6.1, 8, and none	Glass	5.0 kg	100.0 kg	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	10.0 kg		
			Metal	10.0 kg		
			Plastic bag	5.0 kg		
450	UN 3527, Polyester resin kits				5 kg	Aligned to UN P412
Y450	UN 3527, Polyester resin kits				1 kg	

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
451 Wetted explosives	I		Glass	0.5 kg	0.5 kg pax & CAO	UN 1354, UN 1355, UN 1356, UN 3364, UN 3365, UN 3366, UN 3367, UN 3368, UN 3369, UN 3370
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
			Glass	0.5 kg	1.0 kg pax 15.0 kg CAO	UN 1336, UN 1337, UN 1357
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
			Glass	0.5 kg	0.5 kg pax & CAO	UN 1310
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
			Glass	0.5 kg	1.0 kg pax 15.0 kg CAO	UN 1320, UN 1321, UN 1322, UN 1344, UN 1348, UN 1517, UN 3317
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
			Glass	0.25 kg	0.5 kg CAO	UN 1571, UN 2852
452 pax	II		Glass	1.0 kg	15.0 kg	UN 2555
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
			Glass	1.0 kg	1.0 kg	UN 2556
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
			Glass	1.0 kg	1.0 kg	UN 2557
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
453 CAO	II		Glass	1.0 kg	50 kg	UN 2555	single packagings permitted
			Plastic	1.0 kg			
			Metal	1.0 kg			
			Plastic bag	1.0 kg			
			Glass	1.0 kg	15.0 kg	UN 2556 UN 2557	
			Plastic	1.0 kg			
			Metal	1.0 kg			
			Plastic bag	1.0 kg			
454	III				25 kg pax 100 kg CAO	UN 1324	
Y454	III			1 kg	10 kg	UN 1324	
455	III				25 kg pax 100 kg CAO	UN 1944, UN 1945	
Y455	III				10 kg	UN 1944, UN 1945	
456	III				25 kg pax 100 kg CAO	UN 2000	
457	III		Glass	0.5 kg	25 kg pax / 50 kg CAO	UN 3241	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	1.0 kg			
			Plastic bag	1.0 kg			
Y457	III		Glass	0.5 kg	5 kg	UN 3241	
			Plastic	0.5 kg			
			Plastic bag	0.5 kg			
458	II				1.0 kg pax 15 kg CAO	UN 3270	Aligned to UN P411
Y458	II				1.0 kg	UN 3270	
459 Self-reactive substances			Plastic	0.5 L	5.0 L pax	UN 3223, UN 3225	— packagings must meet PG II requirements — Aligned to UN P520
			Plastic	1.0 L	10.0 L CAO		
			Plastic	1.0 L	10.0 L pax	UN 3227, UN 3229, UN 3532	
			Plastic	2.5 L	25.0 L CAO		
			Plastic	0.5 kg	5.0 kg pax	UN 3224, UN 3226	
			Plastic	1.0 kg	10.0 kg CAO		
			Plastic	1.0 kg	10.0 kg pax	UN 3228, UN 3230, UN 3531	
			Plastic	2.5 kg	25.0 kg CAO		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 4						
DIVISION 4.2						
PASSENGER LIQUID						
462	II	6.1, 8, and none	Glass	1.0 L	1.0 L	
			Plastic	1.0 L		
			Metal	1.0 L		
463	III	6.1, 8, and none	Glass	2.5 L	5.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	2.5 L		
			Metal	5.0 L		
CLASS 4						
DIVISION 4.2						
CARGO LIQUID						
464	II	6.1, 8, and none	Glass	2.5 L	5.0 L	
			Plastic	2.5 L		
			Metal	5.0 L		
465	III	6.1, 8, and none	Glass	2.5 L	60.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	5.0 L		
			Metal	10.0 L		
CLASS 4						
DIVISION 4.2						
PASSENGER SOLID						
466	II	6.1, 8	Glass	1.0 kg	15.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
467	II	None	Glass	1.0 kg	15.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Plastic bag	1.0 kg		
468	III	4.3, 6.1, 8	Glass	2.5 kg	25.0 kg	
			Plastic	2.5 kg		
			Metal	5.0 kg		
469	III	None	Glass	5.0 kg	25.0 kg	
			Plastic	10.0 kg		
			Metal	10.0 kg		
			Plastic bag	5.0 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
CLASS 4							
DIVISION 4.2							
CARGO SOLID							
470	II	6.1, 8, and none	Glass	2.5 kg	50.0 kg	single packagings permitted	
			Plastic	5.0 kg			
			Metal	5.0 kg			
			Plastic bag	2.5 kg			
471	III	4.3, 6.1, 8, and none	Glass	5.0 kg	100.0 kg	— packagings must meet PG II requirements; — single packagings permitted	
			Plastic	10.0 kg			
			Metal	10.0 kg			
			Plastic bag	5.0 kg			
CLASS 4							
DIVISION 4.2							
SPECIALS							
472	III			0.1 kg	0.5 kg	UN 1362	
473	II		Glass	1.0 kg	50 kg CAO	UN 1378	
			Metal	1.0 kg			
	II		Glass	1.0 kg	50 kg CAO	UN 2881	
			Metal	1.0 kg			
	III		Glass	1.0 kg	25 kg pax		
			Metal	1.0 kg			
			Glass	2.5 kg	100 kg CAO		single packagings permitted
			Metal	5.0 kg			
CLASS 4							
DIVISION 4.3							
PASSENGER LIQUID							
478	II	None	Glass	1.0 L	1.0 L		
			Plastic	1.0 L			
			Metal	1.0 L			
479	III	6.1, 8, and none	Glass	2.5 L	5.0 L	— packagings must meet PG II requirements; — single packagings permitted	
			Plastic	2.5 L			
			Metal	5.0 L			

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 4						
DIVISION 4.3						
CARGO LIQUID						
480	I	3, 6.1, 3 + 8, None	Glass	1.0 L	1.0 L	
			Plastic	Forbidden		
			Metal	1.0 L		
481	II	6.1, 8, and none	Glass	2.5 L	5.0 L	
			Plastic	2.5 L		
			Metal	5.0 L		
482	III	6.1, 8, and none	Glass	5.0 L	60.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	5.0 L		
			Metal	10.0 L		
CLASS 4						
DIVISION 4.3						
LTD QTY SOLID						
Y474	II	6.1	Glass	0.5 kg	1.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
Y475	II	4.1, 8 and none	Glass	0.5 kg	5.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
Y476	III	4.1, 8 and none	Glass	1.0 kg	5.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
Y477	III	6.1 and none	Glass	1.0 kg	10.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
CLASS 4						
DIVISION 4.3						
PASSENGER SOLID						
483	II	4.1, 4.2, 6.1, 8 and none	Glass	1.0 kg	15.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
484	II	None	Glass	1.0 kg	15.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Plastic bag	1.0 kg		
485	III	4.2, 6.1 and none	Glass	2.5 kg	25.0 kg	Packagings must meet PG II requirements
			Plastic	2.5 kg		
			Metal	5.0 kg		
486	III	4.1, 4.2, 6.1, 8 and none	Glass	5.0 kg	25.0 kg	Packagings must meet PG II requirements
			Plastic	10.0 kg		
			Metal	10.0 kg		
			Plastic bag	5.0 kg		
CLASS 4						
DIVISION 4.3						
CARGO SOLID						
487	I	4.2, 6.1 and none	Glass	1.0 kg	15.0 kg	Single packagings permitted
			Plastic	1.0 kg		
			Metal	1.0 kg		
488	I	4.1, 4.2, 6.1, 8 and none	Glass	1.0 kg	15.0 kg	Single packagings permitted
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Plastic bag	2.5 kg		
489	II	4.1, 4.2 and none	Glass	2.5 kg	50.0 kg	Single packagings permitted
			Plastic	2.5 kg		
			Metal	5.0 kg		
490	II	4.1, 4.2, 6.1, 8 and none	Glass	2.5 kg	50.0 kg	Single packagings permitted
			Plastic	5.0 kg		
			Metal	5.0 kg		
			Plastic bag	2.5 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
491	III	4.1, 4.2, 6.1, 8 and none	Glass	5.0 kg	100.0 kg	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	10.0 kg		
			Metal	10.0 kg		
			Plastic bag	5.0 kg		
CLASS 4						
DIVISION 4.3						
SPECIALS						
492	UN 3292, Batteries containing sodium				Forbidden pax No limit CAO	May be shipped unpackaged.
	UN 3292, Cells containing sodium				25 kg pax 400 kg CAO	Packagings must meet PG II requirements
493 pax UN 3399	II	3	Glass	1.0 L	1.0 L	
			Cylinders	1.0 L		
	III		Glass	5.0 L	5.0 L	Packagings must meet PG II requirements
			Cylinders	5.0 L		
494 CAO UN 3399	I		Glass	1.0 L	1.0 L	
			Cylinders	1.0 L		
	II		Glass	2.5 L	5.0 L	
			Cylinders	2.5 L		
	III		Glass	5.0 L	60.0 L	— packagings must meet PG II requirements; — only cylinders permitted as single packagings
			Cylinders	5.0 L		
495	UN 3476, Fuel cell cartridges				5.0 kg pax 50.0 kg CAO	— Derived from UN P004 — Packagings must meet PG II requirements
Y495	UN 3476, Fuel cell cartridges				2.5 kg	
496	UN 3476, Fuel cell cartridges contained in equipment				5.0 kg pax 50.0 kg CAO	Derived from UN P004
497	UN 3476, Fuel cell cartridges packed with equipment				5.0 kg pax 50.0 kg CAO	Derived from UN P004
499	UN 3319, Nitroglycerin mixture desensitized, solid n.o.s. Requires approval by the appropriate national authority				0.5 kg CAO	UN P099
CLASS 5						
DIVISION 5.1						
LTD QTY LIQUID						
Y540	II	6.1, 8 and none	Glass	0.1 L	0.5 L	
			Plastic	0.1 L		
			Metal	0.1 L		
Y541	III	6.1, 8 and none	Glass	0.5 L	1.0 L	
			Plastic	0.5 L		
			Metal	0.5 L		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 5						
DIVISION 5.1						
PASSENGER LIQUID						
550	II	6.1, 8 and none	Glass	1.0 L	1.0 L	
			Plastic	1.0 L		
			Metal	1.0 L		
551	III	6.1, 8 and none	Glass	2.5 L	2.5 L	Packagings must meet PG II requirements
			Plastic	2.5 L		
			Metal	2.5 L		
CLASS 5						
DIVISION 5.1						
CARGO LIQUID						
553	I	6.1, 8 and none	Glass	1.0 L	2.5 L	
			Plastic	1.0 L		
			Metal	1.0 L		
554	II	6.1, 8 and none	Glass	2.5 L	5.0 L	
			Plastic	2.5 L		
			Metal	2.5 L		
555	III	6.1, 8 and none	Glass	5.0 L	30.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	5.0 L		
			Metal	5.0 L		
CLASS 5						
DIVISION 5.1						
LTD QTY SOLID						
Y543	II	6.1	Glass	0.5 kg	1.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Paper bag	0.5 kg		
			Plastic bag	0.5 kg		
			Fibre	0.5 kg		
Y544	II	8 and none	Glass	0.5 kg	2.5 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Paper bag	0.5 kg		
			Plastic bag	0.5 kg		
			Fibre	0.5 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
Y545	III	8	Glass	1.0 kg	5.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
Y546	III	6.1 and none	Glass	1.0 kg	10.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
CLASS 5						
DIVISION 5.1						
PASSENGER SOLID						
557	I	6.1, 8 and none	Glass	1.0 kg	1.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
558	II	6.1, 8 and none	Glass	1.0 kg	5.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
559	III	6.1, 8 and none	Glass	2.5 kg	25.0 kg	Packagings must meet PG II requirements
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Paper bag	2.5 kg		
			Plastic bag	2.5 kg		
			Fibre	2.5 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
CLASS 5							
DIVISION 5.1							
CARGO SOLID							
561	I	6.1, 8 and none	Glass	1.0 kg	15.0 kg	Single packagings permitted	
			Plastic	1.0 kg			
			Metal	1.0 kg			
562	II	6.1, 8 and none	Glass	2.5 kg	25.0 kg	Single packagings permitted	
			Plastic	2.5 kg			
			Metal	5.0 kg			
			Paper bag	2.5 kg			
			Plastic bag	2.5 kg			
			Fibre	2.5 kg			
563	III	6.1, 8 and none	Glass	5.0 kg	100.0 kg	— packagings must meet PG II requirements; — single packagings permitted	
			Plastic	5.0 kg			
			Metal	5.0 kg			
			Paper bag	5.0 kg			
			Plastic bag	5.0 kg			
			Fibre	5.0 kg			
CLASS 5							
DIVISION 5.1							
SPECIALS							
565 CAO	UN 3356, Oxygen generator, chemical				25 kg	Packagings must meet PG II requirements	
CLASS 5							
DIVISION 5.2							
570 Organic peroxides			Plastic	0.5 L	5.0 L pax	UN 3103, UN 3105	— Packagings must meet PG II requirement — Aligned to UN P520
			Plastic	1.0 L	10.0 L CAO		
			Plastic	1.0 L	10.0 L pax	UN 3107, UN 3109	
			Plastic	2.5 L	25.0 L CAO		
			Plastic	0.5 kg	5.0 kg pax	UN 3104, UN 3106	
			Plastic bag	0.5 kg			
			Plastic	1.0 kg	10.0 kg CAO		
			Plastic bag	1.0 kg			
			Plastic	1.0 kg	10.0 kg pax	UN 3108, UN 3110	
			Plastic bag	1.0 kg			

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
			Plastic	2.5 kg	25.0 kg CAO		
			Plastic bag	2.5 kg			
CLASS 6							
DIVISION 6.1							
LTD QTY LIQUID							
Y640	II	8 and 3 + 8	Glass	0.1 L	0.5 L		
			Plastic	0.1 L			
			Metal	0.1 L			
Y641	II	3 and none	Glass	0.1 L	1.0 L		
			Plastic	0.1 L			
			Metal	0.1 L			
Y642	III	3 and none	Glass	0.5 L	2.0 L		
			Plastic	0.5 L			
			Metal	0.5 L			
CLASS 6							
DIVISION 6.1							
PASSENGER LIQUID							
651	I	8	Glass	0.5 L	0.5 L		
			Plastic	0.5 L			
			Metal	0.5 L			
652	I	3 and none	Glass	0.5 L	1.0 L		
			Plastic	0.5 L			
			Metal	1.0 L			
653	II	4.3, 5.1, 8 and 3 + 8	Glass	1.0 L	1.0 L		
			Plastic	1.0 L			
			Metal	1.0 L			
654	II	3 and none	Glass	1.0 L	5.0 L		
			Plastic	1.0 L			
			Metal	2.5 L			
655	III	3 and none	Glass	2.5 L	60.0 L	Single packagings permitted	
			Plastic	2.5 L			
			Metal	5.0 L			
CLASS 6							
DIVISION 6.1							
CARGO LIQUID							
657	I	5.1 and 8	Glass	1.0 L	2.5 L	Single packagings permitted	
			Plastic	1.0 L			
			Metal	2.5 L			

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
658	I	3 and none	Glass	1.0 L	30.0 L	Single packagings permitted
			Plastic	1.0 L		
			Metal	2.5 L		
659	II	5.1, 4.3 and none	Glass	1.0 L	5.0 L	Single packagings permitted
			Plastic	1.0 L		
			Metal	2.5 L		
660	II	8 and 3 + 8	Glass	1.0 L	30.0 L	Single packagings permitted
			Plastic	1.0 L		
			Metal	2.5 L		
661	II	3 and none	Glass	1.0 L	60.0 L	Single packagings permitted
			Plastic	1.0 L		
			Metal	2.5 L		
662	II	3 and none	Glass	2.5 L	60.0 L	Single packagings permitted
			Plastic	2.5 L		
			Metal	5.0 L		
663	III	3 and none	Glass	5.0 L	220.0 L	Single packagings permitted
			Plastic	5.0 L		
			Metal	10.0 L		
CLASS 6						
DIVISION 6.1						
LTD QTY SOLID						
Y644	II	4.1, 4.3, 5.1 and 8	Glass	0.5 kg	1.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Paper bag	0.5 kg		
			Plastic bag	0.5 kg		
			Fibre	0.5 kg		
Y645	III	None	Glass	1.0 kg	10.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 6						
DIVISION 6.1						
PASSENGER SOLID						
665	I	4.1, 5.1, 8 and none	Glass	0.5 kg	1.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
666	I	None	Glass	0.5 kg	5.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
667	II	5.1	Glass	1.0 kg	5.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
668	II	4.1, 4.2, 4.3 and 8	Glass	1.0 kg	15.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
669	II	None	Glass	1.0 kg	25.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
670	III	None	Glass	5.0 kg	100.0 kg	Single packagings permitted
			Plastic	10.0 kg		
			Metal	10.0 kg		
			Paper bag	5.0 kg		
			Plastic bag	5.0 kg		
			Fibre	5.0 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 6						
DIVISION 6.1						
CARGO SOLID						
672	I	4.1, 5.1, 8 and none	Glass	1.0 kg	15.0 kg	Single packagings permitted
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
673	I	None	Glass	1.0 kg	50.0 kg	Single packagings permitted
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Paper bag	1.0 kg		
			Plastic bag	1.0 kg		
			Fibre	1.0 kg		
674	II	5.1 and none	Glass	2.5 kg	25.0 kg	Single packagings permitted
			Plastic	5.0 kg		
			Metal	5.0 kg		
			Paper bag	2.5 kg		
			Plastic bag	2.5 kg		
			Fibre	2.5 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
675	II	4.1, 4.2, 4.3 and 8	Glass	2.5 kg	50.0 kg	Single packagings permitted	
			Plastic	5.0 kg			
			Metal	5.0 kg			
			Paper bag	2.5 kg			
			Plastic bag	2.5 kg			
			Fibre	2.5 kg			
676	II	None	Glass	2.5 kg	100.0 kg	Single packagings permitted	
			Plastic	5.0 kg			
			Metal	5.0 kg			
			Paper bag	2.5 kg			
			Plastic bag	2.5 kg			
			Fibre	2.5 kg			
677	III	None	Glass	5.0 kg	200.0 kg	Single packagings permitted	
			Plastic	10.0 kg			
			Metal	10.0 kg			
			Paper bag	5.0 kg			
			Plastic bag	5.0 kg			
			Fibre	5.0 kg			
CLASS 6							
DIVISION 6.1							
SPECIALS							
603					< 0.1 kg	UN 3507	Identical to UN P603
679 CAO		4.1			50.0 kg	UN 1700	Packagings must meet PG II requirements
					75.0 kg	UN 2016	
		8			50.0 kg	UN 2017	
680	III		Glass	1.0 L	60.0 L pax	UN 1888	Single packagings permitted
			Plastic	1.0 L			
			Metal	2.5 L			
			Glass	2.5 L	220.0 L CAO		
			Plastic	2.5 L			
			Metal	5.0 L			
Y680	III		Glass	0.1 L	2.0 L	UN 1888	
			Plastic	0.1 L			
			Metal	0.1 L			
	II		Glass	1 L	30 L CAO	Single packagings permitted. Limited to steel	
			Plastic	Forbidden			

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
681 Chlorosilanes CAO			Steel	5 L		
699	I	UN 3123, Toxic liquid, water reactive, n.o.s. UN 3125, Toxic solid, water reactive, n.o.s. Requires approval by the appropriate national authority				UN P099
CLASS 6						
DIVISION 6.2						
620	UN 2814, Infectious substance affecting humans				50 mL / 50 g pax	Aligned to UN P620
	UN 2900, Infectious substance affecting animals				4 L / 4 kg CAO	
621	UN 3291, Clinical waste, Medical waste				No limit	Aligned to UN P621
650	UN 3373, Biological substance, category B				4 L / 4 kg	Aligned to UN P650
CLASS 8						
LTD QTY LIQUID						
Y840	II	3, 3 + 6.1, 5.1, 6.1 and none	Glass	0.1 L	0.5 L	
			Plastic	0.1 L		
			Metal	0.1 L		
Y841	III	6.1 and none	Glass	0.5 L	1.0 L	
			Plastic	0.5 L		
			Metal	0.5 L		
CLASS 8						
PASSENGER LIQUID						
850	I	3, 6.1 and none	Glass	0.5 L	0.5 L	
			Plastic	0.5 L		
			Metal	0.5 L		
851	II	3, 3 + 6.1, 4.2, 4.3, 5.1, 6.1 and none	Glass	1.0 L	1.0 L	
			Plastic	1.0 L		
			Metal	1.0 L		
852	III	6.1 and none	Glass	2.5 L	5.0 L	Packagings must meet PG II requirements
			Plastic	2.5 L		
			Metal	5.0 L		
CLASS 8						
CARGO LIQUID						
854	I	3, 3 + 6.1, 5.1, 6.1 and none	Glass	1.0 L	2.5 L	
			Plastic	1.0 L		
			Metal	1.0 L		
855	II	3, 3 + 6.1, 4.2, 4.3, 5.1, 6.1 and none	Glass	2.5 L	30.0 L	Single packagings permitted
			Plastic	2.5 L		
			Metal	2.5 L		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
856	III	6.1 and none	Glass	5.0 L	60.0 L	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	5.0 L		
			Metal	10.0 L		
CLASS 8						
LTD QTY SOLID						
Y843	II	None	Glass	0.5 kg	1.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
Y844	II	4.1, 4.3, 5.1, 6.1 and none	Glass	0.5 kg	5.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
			Plastic bag	0.5 kg		
Y845	III	6.1 and none	Glass	1.0 kg	5.0 kg	
			Plastic	1.0 kg		
			Metal	1.0 kg		
			Plastic bag	1.0 kg		
CLASS 8						
PASSENGER SOLID						
858	I	4.1, 5.1, 6.1 and none	Glass	0.5 kg	1.0 kg	
			Plastic	0.5 kg		
			Metal	0.5 kg		
859	II	4.1, 4.2, 4.3, 5.1, 6.1 and none	Glass	1.0 kg	15.0 kg	
			Plastic	2.5 kg		
			Metal	2.5 kg		
			Plastic bag	1.0 kg		
860	III	6.1 and none	Glass	2.5 kg	25.0 kg	Packagings must meet PG II requirements
			Plastic	2.5 kg		
			Metal	5.0 kg		
			Plastic bag	2.5 kg		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 8						
CARGO SOLID						
862	I	4.1, 5.1, 6.1 and none	Glass	1.0 kg	25.0 kg	Single packagings permitted
			Plastic	2.5 kg		
			Metal	2.5 kg		
863	II	4.1, 4.2, 4.3, 5.1, 6.1 and none	Glass	2.5 kg	50.0 kg	Single packagings permitted
			Plastic	5.0 kg		
			Metal	5.0 kg		
			Plastic bag	2.5 kg		
864	III	6.1 and none	Glass	5.0 kg	100.0 kg	— packagings must meet PG II requirements; — single packagings permitted
			Plastic	5.0 kg		
			Metal	10.0 kg		
			Plastic bag	5.0 kg		
CLASS 8						
SPECIALS						
866 UN 2028	II				50.0 kg CAO	Aligned to UN P803
867 UN 2803	III		Plastic	3.5 kg	20 kg	Packagings must meet PG I requirements
868 UN 2809	III		Glass	2.5 kg	35.0 kg	— packagings must meet PG I requirements; — only single packagings permitted – welded steel bottles
			Plastic	2.5 kg		
869	UN 3506, Mercury contained in manufactured articles				No limit	Strong outer packagings
870	UN 2794, Batteries, wet, filled with acid				30 kg G pax	Packagings must meet PG II requirements
	UN 2795, Batteries, wet, filled with alkali				400 kg CAO	
871	UN 3028, Batteries, dry, containing potassium hydroxide, solid				25 kg pax 230 kg CAO	Packagings must meet PG II requirements
872	UN 2800, batteries, wet, non-spillable				No limit	Strong outer packagings
873	UN 3477, Fuel cell cartridges				5.0 kg pax	— Derived from UN P004 — Packagings must meet PG II requirements
					50.0 kg CAO	
Y873	UN 3477, Fuel cell cartridges				2.5 kg	
874	UN 3477, Fuel cell cartridges contained in equipment				5.0 kg pax	Derived from UN P004
					50.0 kg CAO	
875	UN 3477, Fuel cell cartridges packed with equipment				5.0 kg pax	Derived from UN P004
					50.0 kg CAO	
876 Chlorosilanes CAO	II		Glass	1 L	30 L CAO	Single packagings permitted. Limited to steel
			Plastic	Forbidden		
			Metal	5 L		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
CLASS 9						
950	UN 3166, Vehicle, flammable liquid powered, Vehicle, fuel cell, flammable liquid powered				No limit	
951	UN 3166, Vehicle, flammable gas powered, Vehicle, fuel cell, flammable gas powered				No limit CAO	
952	UN 3171, Battery-powered equipment UN 3171, battery-powered vehicle				No limit	
953	UN 2807, Magnetized material				No limit	
954	UN 1845, Cargo dioxide, solid, Dry ice				200 kg	
955	UN 2990, Life-saving appliances, self-inflating UN 3072, Life-saving appliances, not self-inflating				No limit	

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
956	II		Glass	10 kg	100 kg pax 200 kg CAO	UN 3152, UN 3432	Single packagings permitted
			Fibre	50 kg			
			Metal	50 kg			
			Paper bag	50 kg			
			Plastics	50 kg			
			Plastic bag	50 kg			
	II		Glass	10.0 kg	No limit	UN 2969	
			Fibre	50.0 kg			
			Metal	50.0 kg			
			Paper bag	50.0 kg			
			Plastics	50.0 kg			
			Plastic bag	50.0 kg			
	III		Glass	10 kg	200 kg pax 200 kg CAO	UN 1841	
			Fibre	50 kg			
			Metal	50 kg			
			Paper bag	50 kg			
			Plastics	50 kg			
			Plastic bag	50 kg			
	III		Glass	10 kg	100 kg pax 200 kg CAO	UN 1931, UN 2216,	
			Fibre	50 kg			
			Metal	50 kg			
			Paper bag	50 kg			
			Plastics	50 kg			
			Plastic bag	50 kg			
	III		Glass	10.0 kg	400 kg pax/CAO 1 000 kg in IBC pax / CAO (UN 3077 only)	UN 3077, UN 3335	
			Fibre	50.0 kg			
			Metal	50.0 kg			
			Paper bag	50.0 kg			
			Plastics	50.0 kg			
			Plastic bag	50.0 kg			
Y956	III		Glass	5.0 kg	30 kg G	UN 3077 & UN 3335	
			Plastic	5.0 kg			

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS	
			Metal	5.0 kg			
			Paper bag	5.0 kg			
			Plastic bag	5.0 kg			
			Fibre	5.0 kg			
957	III	UN 2211, Polymeric beads, expandible			100 kg pax	Single packagings permitted	
		UN 3314, Plastics moulding compound			200 kg CAO		
958	III	UN 2071, Ammonium nitrate-based fertilizer			200 kg pax	Single packagings permitted	
		UN 2590, Asbestos, chrysotile			200 kg CAO		
Y958	III				30.0 kg G	UN 2071	
959	UN 3245, Genetically modified (micro-)organisms				No limit	Aligned to UN P904	
960 UN 3316			250 mL/IP	1.0 L/kit	10.0 kg	Aligned to UN P901	
			250 g/IP	1.0 kg/kit			
Y960 UN 3316			30 mL/IP	1.0 L/kit	1.0 kg		
			100 g/IP	1.0 kg/kit			
961 UN 3268					25 kg pax 100 kg CAO	Aligned to UN P902	
962 UN 3363					0.5 L; or 1 kg; or 0.5 kg gas		
Y963				500 mL/g	30 kg G	ID 8000	
964			Glass	10.0 L	100 L pax 220 L CAO	UN 1941, UN 1990, UN 2315, UN 3151	Single packagings permitted
			Plastic	30.0 L			
			Metal	40.0 L	450 L	UN 3082 UN 3334	
Y964			Glass	5.0 L	30 kg G	UN 1941, UN 1990, UN 3082, UN 3334	
			Plastic	5.0 L			
			Metal	5.0 L			
965	UN 3480, Lithium ion batteries				Pax Forbidden 35 kg CAO	Packagings must meet PG II requirements	
966	UN 3481 Lithium ion batteries packed with equipment				5 kg pax 35 kg CAO		
967	UN 3481 Lithium ion batteries contained in equipment				5 kg pax , 35 kg CAO	Strong outer packagings	
968	UN 3090, Lithium metal batteries				Pax Forbidden 35 kg CAO	Packagings must meet PG II requirements	
969	UN 3091 Lithium metal batteries packed with equipment				5 kg pax 35 kg CAO		

CLASS / AIRCRAFT TYPE	PACKING GROUP	SUBSIDIARY HAZARD	IP TYPE	INNER QTY	QTY / PACKAGE	OTHER CONSIDERATIONS
970	UN 3091 Lithium metal batteries contained in equipment				5 kg pax, 35 kg CAO	Strong outer packagings
971	UN 3499 Capacitor, UN 3508, Capacitor, asymmetric				No limit	
972	UN 3530 Englines & Machinery				No limit	
975	UN 3549, Articles containing miscellaneous dangerous goods, n.o.s. (restricted to articles containing environmentally hazardous substances)				No limit	Based on UN P006

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PART 5

SHIPPER'S RESPONSIBILITIES

5.1 General

5.1.1 To ensure that all persons on the transport chain are aware of the potential hazards associated with dangerous goods, shippers are required to ensure that packages of dangerous goods offered for air transport must have defined marking and labelling and specific information must be provided on the dangerous goods transport document.

5.1.2 The provisions of Part 5 of the Technical Instructions largely reflect those of Part 5 — Consignment Procedures of the UN Model Regulations to ensure modal harmonisation, although the Panel has determined in some instances to apply more stringent requirements.

5.2 Marking

In addition to the marking requirements specified in the UN Model Regulations the Panel has also adopted special marking requirements for:

a) Refrigerated liquefied gases;

b) Carbon dioxide, solid. (dry ice); and

c) Oxygen generators (PBE) when shipped on a passenger aircraft.

These requirements have been added to address specific operational safety needs to address the handling of packages containing cryogenic liquids, to manage the risk of asphyxiation resulting from the potential build up of carbon dioxide gas in the cargo compartments and to identify that, notwithstanding being forbidden on a passenger aircraft, the PBE may be shipped on a passenger aircraft subject to the conditions in Special Provision A144.

5.3 Labelling

5.3.1 The design and size of hazard labels is aligned with those in the UN Model Regulations, except that the Technical Instructions does not permit the use of reduced size hazard labels other than for packages containing substances in Division 6.2, infectious substances.

5.3.2 The Panel agreed to allow hazard and handling labels to be reduced in size to no less than half the specified dimensions on packages for Division 6.2 substances in recognition that the net quantities permitted in air transport invariably result in packagings that have external dimensions that may be too small to permit full size hazard labels.

5.3.3 In addition to the UN design hazard labels, the Technical Instructions also mandates the use of specific handling labels for:

a) Magnetized material (UN 2807);

b) Substances or quantities permitted only on a cargo aircraft (cargo aircraft only);

c) Refrigerated liquefied gases (cryogenic liquid);

d) Self-reactive substances and organic peroxides (keep away from heat); and

e) Radioactive materials in excepted packages (radioactive material, excepted package).

5.3.4 The Panel adopted these handling labels to ensure that substances or articles that have specific handling requirements or limitations are visibly identified so the handling requirements can be applied through the course of air transport.

5.3.5 The Technical Instructions also specify that the Cargo Aircraft Only label, when required, must be applied to the same surface of the package as the hazard label(s). This requirement was adopted to assist awareness of operator personnel on the resctriction so as to facilitate the correct handling of packages restricted carriage on a cargo aircraft.

5.4 **Documentation**

5.4.1 The documentation requirements in Part 5;4 of the Technical Instructions are largely aligned with 5.4 in the UN Model Regulations, except that the Panel has specified more detailed requirements in 5;4.1.5.1 where the shipper is required to specify the net quantity in each package by package type, rather than just the total quatity of dangerous goods by proper shipping name and packing group as applies in the UN Model Regulations. This is required so that the operator when performing the acceptance for dangerous goods can verify that the net quantity declared in each package does not exceed the net quantity permitted by Table 3-1 in the Technical Instructions.

5.4.2 The Panel has also adopted a requirement for the "Q" value to be on the document where the shipper has packed multiple dangerous goods into the same outer packaging. Where the shipper places multiple dangerous goods in the same outer packaging, there is a need to ensure that the total net quantity of the dangerous goods in the package does not exceed that permitted for the dangerous goods as shown in Table 3-1. This is achieved by calculating the net quantity of each dangerous goods as a ratio of the different dangerous goods against the net quantity permitted in Table 3-1 for that packing instruction. The calculation applied is called the "Q" value where the calculated value must not exceed "1".

5.4.3 The Technical Instructions include requirements that a special provision number must be indicated on the dangerous goods transport document when:

a) dangerous goods are offered under a specific approval, e.g. A1, A2, A88;

b) there is a need to identify compliance with specific conditions of a special provision;

c) the special provision permits a net quantity in excess of that normally permitted by Table 3-1 of the Technical Instructions.

5.5 **Other Requirements**

5.5.1 The Technical Instructions do not include the provisions of Chapter 5.3 - Placarding and Marking of Cargo Transport Units and Bulk Containers, from the UN Model Regulations as these devices are not carried in air transport. The identification of aircraft unit load devices (ULD) containing packages

or overpacks of dangerous goods is addressed in Part 7 — Operator's Responsibilities of the Technical Instructions.

5.5.2 The provisions set out in Chapter 5.5 — Special Provisions, in the UN Model Regulations that specify requirements for the placarding, transport and handling of certain substances or articles have not been included in the Technical Instructions as either the allowance in the UN Model Regulations is not permitted in air transport or the Technical Instructions apply more detailed requirements than the UN Model Regulations.

5.5.3 Articles such as fumigated cargo transport units (5.5.2 in the UN Model Regulations) and cargo transport units containing substances used for cooling or conditioning (5.5.3 in the UN Model Regulations) have not been included in the Technical Instructions as these are not permitted in air transport.

5.5.4 For goods shipped with dry ice (cabon dioxide, solid) (5.5.4 in the UN Model Regulations), the Technical Instructions apply more restrictive requirements where dry ice, even when used as a refrigerant for non-dangerous goods, is subject to all provisions of the Technical Instructions other than the requirement for a dangerous goods transport document.

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PART 6

PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS

6.1 General

6.1.1 Part 6 contains the requirements for the construction, testing and approval of packagings employed for the transport of dangerous goods of all classes. For most packaging types, it also prescribes codes to identify the packaging type, and packaging marks which are intended to indicate the performance parameters to which the packaging has been designed, constructed and tested as well as to aver compliance to the applicable requirements of Part 6. As a general rule, the Technical Instructions require that dangerous goods be packed in packagings, as prescribed in the various packing instructions in Part 4 of the Technical Instructions, conforming to Part 6. However, there are a number of exceptions to this general rule where the Technical Instructions permit dangerous goods to be packed in packagings not required to meet any or all of the requirements of Part 6. These exceptions include, for example, dangerous goods in "limited quantities" and "excepted quantities," and those instances where individual packing instructions specifically provide for the use of packagings not complying with the requirements of Part 6.

6.1.2 To ensure modal harmonisation, the provisions of Part 6 of the Technical Instructions, in general, are closely aligned with those in the corresponding chapters in Part 6 of the UN Model Regulations. The Panel, however, has determined that some UN packagings are inappropriate for use in air transport, e.g. composite packagings with a glass, porcelain or stoneware inner receptacle as these are seen as insufficiently robust for air transport.

6.2 Applicability, Nomenclature and Codes

6.2.1 Chapter 1 indicates which of the eight chapters in Part 6 apply to dangerous goods of the various classes or divisions. It also explains the codes for designating the types of packagings generally employed as single packagings or the outer packaging of combination packagings for liquid and solid dangerous goods, including infectious substances, and as the outer packaging of combination packagings containing gases in certain types of inner receptacles (e.g., aerosols). The codes indicated in Chapter 1 do not cover pressure receptacles for gases, the identification of which is addressed in Chapter 5. Also not defined in Chapter 1 are the codes designating the various types of intermediate bulk containers (IBCs) authorized by the Technical Instructions only for use for environmentally hazardous solid substances (UN3077) – the explanation of the codes for which Chapter 8 defers to Chapter 6.5 of the UN Model Regulations.

6.2.2 Table 6-2 is an "Index of packagings other than inner packagings" and is based on the table in 6.1.2.7 of the UN Model Regulations. It lists the "kinds" of packagings and, if any, the "category" within that "kind," and indicates the packaging code identifying each kind/category. In most cases a reference to the section in Chapter 3 in which the relevant design and construction requirements for the packagings are specified is provided, as well as the maximum permitted volumetric capacity and/or net mass of each kind/category of packaging. For those kinds/categories of packagings that the Panel has deemed unsuitable for use in air transport, (e.g., due to insufficient moisture resistance or potential fragility of the inner receptacle), which include textile bags without inner liner or coating and a total of eleven categories of composite packagings employing glass, porcelain or stoneware inner receptacles, the words "Not used in these Instructions" appear in place of the standard Chapter 3 section reference and quantity limits.

6.2.3 Table 6-3 is an "Index of inner packagings" which lists the "kinds" of inner packagings referred to in the packing ~~I~~instructions in Part 4 of the Technical Instructions. For each kind, the paragraph

in Chapter 3;3.2 in which the basic requirements for the inner packaging are presented is indicated~~, along with, in the case of aerosol inner receptacles only, an inner packaging identification code~~. The UN Model Regulations do not prescribe such requirements for inner packagings of combination packagings, and so there is no corresponding table in the UN Model Regulations.

6.3 Marking of Packagings Other Than Inner Packagings

6.3.1 Chapter 2 prescribes the requirements for the marking of the kinds/categories of packagings listed in Table 6-2 of Chapter 1, other than those employed for Category A infectious substances, but including reconditioned packagings. Also addressed are the markings for salvage packagings. Examples of conforming packaging markings are provided. These marking requirements (and the examples) are fully aligned with the corresponding requirements and examples in Section 6.1.3 of the UN Model Regulations, as necessary to ensure multi-modal harmonisation.

6.4 Requirements for Packagings

6.4.1 Chapter 3 – "Requirements for Packagings" – is divided into two main sections. The first, Section 3.1, prescribes the requirements for packagings (other than inner packagings), while Section 3.2 provides the requirements for inner packagings.

6.4.2 Section 3.1 prescribes the basic design and construction requirements, as well as maximum volumetric and/or mass capacities, for the kinds/categories of packagings listed in Table 6-2 of Chapter 1 (including when used for Category A infectious substances), except for those indicated in that table as "Not used in these Instructions." The requirements in Section 3.1 for the kinds/categories of packagings "used" in the Technical Instructions are fully aligned with those in the corresponding Section 6.1.4 of the UN Model Regulations, as is necessary to ensure multimodal harmonisation.

6.4.3 As previously stated, the UN Model Regulations do not contain basic design and construction requirements for inner packagings. Therefore, the provisions for inner packagings in Section 3.2 are unique to the Technical Instructions and have no counterparts in the UN Model Regulations. Most of these rather basic requirements had their origins in air industry regulations that were applied in the years prior to the development of the Technical Instructions, and were carried over into the earliest editions of the Technical Instructions to ensure that inner packagings allowed under those Instructions were suitable for the air transport environment. The provisions for plastics aerosols, however, were added to the Technical Instructions at a later date.

6.4.3.1 ~~Except for aerosol inner packagings, t~~The inner packagings for which requirements are prescribed (i.e., glass and plastic inner packagings, metal cans, tins and tubes, paper and plastic bags, fibre cans and boxes, and metal and plastic flexible tubes) are not assigned identifying codes. The requirements for these inner packagings are quite general in nature and, with the exception of a required minimum 0.1 mm thickness for plastic bags, are devoid of "specification" requirements.

6.4.3.2 ~~The codes IP.7, IP.7A and IP.7B are used to designate the three types of non-refillable metal aerosol inner packagings. Unlike the other types of inner packagings, rather detailed specifications are provided for the metal aerosol containers. The three types differ according to minimum thickness, minimum burst pressure and other design considerations. Also, unlike the other types of inner packagings, qualification and manufacturing tests are prescribed for the metal aerosol types. These specifications originated from the air industry regulations applied prior to development of the Technical Instructions and have been included in the Technical Instructions from its inception. While the UN Model Regulations do not contain similar detailed requirements for metal aerosols and specify only a maximum capacity and a minimum burst pressure (the latter based on the hazard(s) of the propellant), it should be noted that the~~

~~historic 820 mL capacity limit for IP.7 and IP.7A metal aerosols was, in the 2021-2022 edition of the Technical Instructions, increased by the Panel to 1000 mL to harmonize with the maximum capacity for aerosols permitted under the UN Model Regulations.~~ The UN minimum burst pressure for aerosols ~~has been~~was introduced into Part 6;5.4 in the 2023-2024 Edition of the Technical Instructions.

~~6.4.3.3 Plastic, non-refillable aerosols are assigned the code IP.7C. The requirements for plastic aerosols were added to Section 3.2 more recently as the use of plastic aerosols became more common. The requirements for IP.7C aerosols in the Technical instructions, like those for metal aerosols, contain certain specific material and design requirements, as well as design qualification and manufacturing tests. While once again there are no corresponding requirements in the UN Model Regulations, the IP.7C requirements developed by the Panel take account of industry practice in the design, construction and testing of plastic aerosols, as well as standards that had been applied by States.~~

6.5 Packaging Performance Tests

Chapter 4 prescribes the packaging performance tests applicable to the kinds/categories of packagings listed in Table 6-2 of Chapter 1, except when those packagings are used for Category A infectious substances (in which case the performance tests in Part 6;6.5 apply). To ensure the necessary multimodal harmonisation, the requirements in Chapter 4 are fully harmonised with the corresponding test requirements in 6.1.5 of the UN Model Regulations.

6.6 Requirements for the Construction and Testing of Cylinders and Closed Cryogenic Receptacles, Aerosol Dispensers and Small Receptacles Containing Gas (Gas Cartridges) and Fuel Cell Cartridges Containing Liquefied Flammable Gas

6.6.1 Chapter 5 prescribes the requirements for packagings used to transport gases. In this regard, it addresses two separate and rather distinct matters. The first concerns the requirements for cylinders and closed cryogenic receptacles, which are generally employed as single packagings. The second relates to the requirements for receptacles generally transported as inner packagings of combination packagings, including aerosols, gas cartridges, and fuel cell cartridges which contain liquefied, flammable gas.

6.6.2 Sections 5.1, 5.2 and 5.3 provide the requirements for the design, construction, initial inspection and testing, approval, marking, periodic inspection and testing, and related requirements for cylinders and closed cryogenic receptacles. In the UN Model Regulations, the corresponding provisions are presented in 6.2.1, 6.2.2 and 6.3.3. Under the UN Model Regulations, these sections broadly apply to "pressure receptacles" for gases. As defined in 1.2.1 of the UN Model Regulations, and, consistent with the UN definition, in Part 1;3.1.1 of the Technical Instructions, the term "pressure receptacle" includes "cylinders, tubes, pressure drums, closed cryogenic receptacles, metal hydride storage systems, bundles of cylinders and salvage pressure receptacles," as those terms are defined in 1.2.1 of the UN Model Regulations. The UN definition of each of these terms also appears in Part 1;3.1.1 of the Technical Instructions. However, since the Panel has decided that tubes, pressure drums, bundles of cylinders and salvage pressure receptacles should not ~~permitted~~be permitted for air transport, the definitions of these terms in the Technical Instructions include the statement "Not permitted for air transport." For this reason, where in the text of 6.2.1, 6.2.2 and 6.2.3 of the UN Model Regulations the term "pressure receptacle" is used, in the corresponding provisions of the Technical Instructions that term is generally replaced by "cylinder and closed cryogenic receptacles," which are the main categories of "pressure receptacle" permitted for air transport under the relevant packing instructions in Part 4 of the Technical Instructions.

6.6.2.1 Consistent with 6.2.1 of the UN Model Regulations, Section 5.1 in the Technical Instructions provides general requirements applicable to UN cylinders and closed cryogenic receptacles

(see 6.2.2.2, below), as well as to non-UN cylinders and closed cryogenic receptacles (see 6.2.2.3, below). However, as explained above, where the term "pressure receptacle" appears in a provision in the UN text, in the corresponding provision in 5.1 of the Technical Instructions it has been replaced by "cylinders and closed cryogenic receptacles." Further, where a general requirement applies only to a type of pressure receptacle not authorized for use under the Technical Instructions, to maintain a general consistency with the paragraph numbering in the UN Model Regulations the corresponding paragraph number in the Technical instructions appears, followed by the words "Not used" (i.e., with the UN text being omitted). Apart from these differences, the provisions of 5.1 in the Technical Instructions are fully harmonised with the corresponding requirements in 6.2.1 of the UN Model Regulations.

6.6.2.2 Consistent with 6.2.2 of the UN Model Regulations, Section 5.2 in the Technical Instructions provides requirements applicable to UN cylinders and closed cryogenic receptacles, including for design, construction, inspection and testing, approval and marking. However, as explained above, where the term "pressure receptacle" appears in a provision in the UN text, in the corresponding provision in 5.2 of the Technical Instructions it has been replaced by "cylinders and closed cryogenic receptacles." For purposes of specifying the detailed requirements for design, construction and periodic testing of cylinders and closed cryogenic receptacles, a series of ISO standards are referenced. Where a particular provision or ISO standard referenced in the UN Model Regulations applies solely to a type of pressure receptacle not authorized for transport under the Technical Instructions, to maintain a general consistency with the paragraph numbering in the UN Model Regulations the corresponding paragraph number in the Technical ~~i~~Instructions appears followed by the words "Not used" (i.e., with the ISO standard identification and/or UN text being omitted). Apart from these differences, the provisions of 5.2 in the Technical Instructions are fully harmonised with the corresponding requirements in 6.2.2 of the UN Model Regulations.

6.6.2.3 Consistent with 6.2.3 of the UN Model Regulations, Section 5.3 in the Technical Instructions provides requirements applicable to non-UN cylinders and non-UN closed cryogenic receptacles. For purposes of design, construction, inspection, testing, approval and marking of non-UN cylinders and closed cryogenic receptacles, Section 5.3 relies heavily on requirements of, and technical codes recognized by, the appropriate national authority, and itself provides only the most general requirements (which are coupled with the general requirements in Section 5.1). Again, as explained above, where the term "pressure receptacle" appears in the UN text, in the corresponding provision in 5.3 in the Technical Instructions it has been replaced by "cylinders and closed cryogenic receptacles." Apart from this, the provisions of 5.3 in the Technical Instructions are fully harmonised with the corresponding requirements in 6.2.3 of the UN Model Regulations.

6.6.3 Section 6.4 provides requirements for the post-filling leak-testing of aerosol dispensers, small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied gas, which are invariable~~y~~ transported as inner packagings of combination packagings. ~~As it relates to aerosol dispensers, the requirements of 5.4 are in addition to any container qualification or manufacturing testing that may be prescribed in 6;3.2.~~ Section ~~5~~6.4 is fully harmonised with the corresponding provisions appearing in 6.2.4 of the UN Model Regulations.

6.7 Packagings for Infectious Substances of Category A

6.7.1 Chapter 6 prescribes the requirements for packagings employed for the transport of Category A infectious substances (UN2814 and UN2900). The chapter corresponds to, and is fully harmonised with, Chapter 6.3 of the UN Model Regulations.

6.7.2 For purposes of identifying the kinds/categories of packaging, Chapter 6 relies on the listing of codes in Table 6-2 in Chapter 1. In addition, in terms of the design and construction requirements

for the kinds/categories of packagings identified in Table 6-2 of Chapter 1, Chapter 6 relies on the requirements specified for those packagings in Chapter 3;3.2, as applicable.

6.7.3 The requirements for the marking and performance testing of Category A infectious substance packagings are prescribed in Sections 6.4 and 6.5, respectively. It should be noted that these marking and testing requirements are unique to infectious substances packagings, and differ from those in Chapters 2 and 4, respectively, which are applicable to the same kinds/categories of packagings when used for dangerous goods of other classes and divisions.

6.8 Requirements for the Construction, Testing and Approval of Packages for Radioactive Material and for the Approval of Such Material

6.8.1 Chapter 7 prescribes requirements for the construction, testing and approval of packages for radioactive material and for the approval of the transport of radioactive material. The chapter is closely harmonised with the corresponding Chapter 6.4 of the UN Model Regulations, which in turn is derives~~d~~ from the relevant International Atomic Energy Agency (IAEA) regulations governing the safe transport of radioactive material (SSR-6). However, there are a very limited number of differences. Since portable tanks and IBCs are not generally authorized by the Technical Instructions for air transport, the provisions in the UN Model Regulations allowing portable tanks and IBCs to be employed as Industrial Packagings (IP) IP-2 and IP-3 do not appear in the Technical Instructions. In addition, certain provisions in the UN Model Regulations that are superseded by the requirements in Section 7.2 for packages transported by air, have been omitted from the Technical Instructions. Finally, rather than reproducing the rather lengthy provisions regarding applications for, and approvals to transport radioactive material which appear in Section 6.4.23 of the UN Model Regulations, 7.22 in the Technical Instructions simply references those UN provisions.

6.9 Requirements for Intermediate Bulk Containers

6.9.1 Intermediate bulk containers (IBCs), owing to their relatively high capacity (mass or volume), had traditionally not been permitted for the transport of dangerous goods by aircraft. However, when to Panel decided that certain IBCs could be authorized for solid environmentally hazardous substances (UN3077) under Packing Instruction 956, Chapter 8 was added to Part 6 of the Technical Instructions. Because only this very limited category of substances would be permitted for transport by aircraft in IBCs, the Panel considered it unnecessary to incorporate all of the design, construction, and testing requirements for IBCs, or the coding system identifying IBC types - all of which appear in Chapter 6.5 of the UN Model Regulations - into the Technical Instructions. Instead, Part 6;8.1.1 simply cross references the requirements in Chapter 6.5 of the UN Model Regulations. However, to facilitate operator acceptance checks, the Panel considered it appropriate to include the requirements for marking IBCs, as they appear in 6.5.2.1.1 and 6.5.2.2.2 of the UN Model Regulations, into the new Chapter 8. This would allow a determination to be made that the IBC is of a type as authorized in Packing Instruction 956 and that the IBC satisfies the necessary performance parameters and filling limitations. An example of a proper IBC marking was also included in Chapter 8.

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PART 7

OPERATOR'S RESPONSIBILITIES

7.1 Operator's Responsibilities

7.1.1 Most of the requirements contained in Part 7 of the Technical Instructions have been developed by the Panel and have no equivalent in the UN Model Regulations. Exceptions are separation of explosives by compatibility group; also the Tables specifying the distances by which radioactive material must be separated from persons are based on criteria laid down by IAEA. The UN Model Regulations make it clear that modes are expected to develop their own requirements concerning handling once the dangerous goods have been delivered to the operator for transport but do include the need for emergency response information to be available.

7.1.2 The Technical Instructions mandate that the operator must perform an acceptance check of all dangerous goods offered for transport that are declared on the dangerous goods transport document and in addition for consignments where dry ice is used as a refrigerant for non-dangerous goods. The purpose of the acceptance is for the operator to confirm, to the extent possible, that the dangerous goods being offered for transport are in compliance with the provisions of the Technical Instructions applicable to the specific dangerous goods.

7.2 Segregation of Dangerous Goods

7.2.1 The UN Model Regulations contain general information about segregating incompatible dangerous goods; and this includes applying the segregation requirements where the dangerous goods has a subsidiary hazard(s). In the Technical Instructions, this general information has been turned into a Table showing certain classes and divisions which need to be segregated from each other and from other classes/divisions.

7.2.2 When certain dangerous goods are mixed in the same packagings or inadvertently leak onto each other, violent reactions may occur, such as combustion or dangerous evolution of heat; the evolution of flammable, poisonous, or asphyxiant gases; or the formation of unstable or corrosive materials. Incompatible dangerous goods must not be loaded on an aircraft or placed into a unit load device together to avoid possible reactions between the dangerous goods or reduce the hazards of any accidental leakage or spillage. Adoption of UN Model Regulations for stowage and segregation should be predicated on the risk to air transport.

7.2.3 The Panel reviewed and revised the segregation requirements in 1999 when it was confirmed that segregation of incompatible dangerous goods must also consider all subsidiary hazards. The Panel then considered that while dangerous goods may react if mixed, for this to happen in transport would require the failure of two sets of packagings for the substances to be able to come into contact.

7.2.4 The segregation table, Table 7-1, was further revised effective the 2019-2020 edition of the Technical Instructions to require segregation between lithium batteries (UN nos 3090 and 3480) and dangerous goods with explosive or flammable properties.

7.3 Loading of Cargo Aircraft

7.3.1 Since its development in the late 1970s, the Technical Instructions has differentiated between dangerous goods that are acceptable for transport on a passenger aircraft and those that may be carried on a cargo aircraft.

7.3.2 For transport on a passenger aircraft the approach has generally been that the risk posed by the dangerous goods should be as close to zero as possible. This is achieved by limiting the type of dangerous goods allowed, reducing the net quantity per package and requiring combination packagings, unless the dangerous goods are low hazard, i.e. for certain classes or divisions only those in Packing Group III. This has been done on the basis that passengers have no knowledge of the presence of the dangerous goods carried as cargo and no training in the event of an emergency.

7.3.3 For carriage on a cargo aircraft, there are a wider range of dangerous goods permitted in greater net quantities per package and single packagings are more widely applied, generally for substances in Packing Groups II and III for most classes and divisions.

7.4 Segregation of Radioactive Materials

7.4.1 The IAEA Regulations contain the general requirement for segregating radioactive materials from persons and film; these state the maximum levels of exposure in either annual dose rate or per consignment. Many years ago, these levels were used to develop Tables 7-3 and 7-4 giving ranges of Transport Indices and distances which ~~identify how far~~specify the minimum distances from the surface of the package that radioactive materials ~~need~~ must~~to~~ be stowed from the inside surface of the passenger cabin or flight deck partitions or floors to ensure adequate radiation protection for persons. A similar table, Table 7-8, is provided that specifies the minimum distance from overpacks or packages of radioactive materials to undeveloped ~~and~~ film based on the Transport Index and the duration of carriage.

7.4.2 The values developed by the IAEA[4] that were used by the DGP to establish the minimum separation distances shown in Tables 7-3 and 7-4 are very conservative and ensure that when used flight and cabin crew and passengers will not be exposed to a dose rate greater than 1 mSv per annum. Reviews have been undertaken in several Contracting States over the years to demonstrate that the distances required by the Tables do ensure the necessary level of protection.

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[4] The methodolgy and calculations used by the IAEA to develop the minimum segregation distance requirements are described in *Advisory Material for the IAEA Regulations for the safe Transport of Radioactive Material* (Specific Safety Guide No. SSG-26), Appendix III.

PART 8

PROVISIONS FOR PASSENGERS AND CREW

8.1 General

8.1.1 Many dangerous goods are used by people in everyday life, such as perfumes, aerosols and portable electronic devices powered by lithium batteries. Other dangerous goods are used in medical applications or in specific equipment needed by persons with disabilities, such as mobility aids powered by wet, non-spillable batteries or lithium batteries, and cylinders of gaseous oxygen. To address the need for passengers and crew to be able to carry as part of their luggage these dangerous goods while still ensuring the required level of safety the Panel has developed provisions for certain dangerous goods to be permitted in baggage.

8.1.2 Where there is a need for the operator to perfom some verification of the type of dangerous goods being carried or to manage the actual acceptance and loading of the dangerous goods, there is a requirement that dangerous goods may only be carried with the approval of the operator. Examples of these include the allowance for 5 kg of sporting ammunition, which must be in checked baggage, battery-powered mobility aids and medical devices with larger lithium batteries.

8.1.3 The Panel has also considered whether there should be a requirement or restriction on where the dangerous goods may be carried. For example, ammunition must be in checked baggage for security reasons. Spare lithium batteries must be in carry-on baggage; these are forbidden as cargo on passenger aircraft due to the risk and allowing their carriage in checked baggage would be analogous to carriage as cargo.

8.1.4 The dangerous goods listed in the Tables in Part 8 are the only dangerous goods that are permitted to be carried by passengers and crew. These dangerous goods may not be carried for commercial purposes but must be for personal use only.

8.1.5 The provisions to carry these dangerous goods are divided into three parts:

a) The location (checked baggage or carry-on baggage);

b) The requirement for an approval of the operator to allow passengers and crew to carry specific dangerous goods; and

c) The restrictions (e.g. quantity, quality, packaging, use, etc.).

These provisions are developed taking into account the hazards of the dangerous goods, the risk mitigation measures on board the aircraft and the technological evolution.

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PART 9

ATTACHMENTS — STATE AND OPERATOR VARIATIONS

9.1 State Variations

9.1.1 Included in the attachments to the Technical Instructions is a list of variations notified by States. The variations apply as follows:

a) where such variations result in more restrictive provisions than those contained in theTechnical Instructions, they apply to the transport of dangerous goods by air:

1) to, from or through all territory subject to the sovereignty of the notifying State by all operators; and

2) outside the territory of the notifying State to all operators for whom the notifying State is the State of the Operator;

b) where such variations result in less restrictive provisions than those contained in these Instructions, the variations are listed for information only and may only be applied within the territory of the notifying State by operators for whom the notifying State is the State of the Operator.

9.1.2 The State variations have no legal status of their own. They may only be enforced by the State notifying the variation where the requirement exists in national law of the State.

9.2 Operator Variations

9.2.1 Also included in the attachments to the Technical Instructions are variations that have been notified to ICAO by operators. The operator variations are advice that the operator concerned has specified that they have more restrictive provisions than those in the Technical Instructions for the transport of dangerous goods.

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PART 10

SUPPLEMENT TO THE TECHNICAL INSTRUCTIONS

10.1 General

10.1.1 The Supplement contains information primarily of interest to member States and to shippers of dangerous goods which are normally forbidden by the Technical Instructions and which can only be carried under an approval or exemption.

10.1.2 The Supplement also contains guidance for member States on providing information for passengers, the reporting of accidents and incidents, inspections and enforcement.

10.2 Dangerous Goods List

10.2.1 The dangerous goods list contains all the entries in the list in the Technical Instructions which are shown as being forbidden in normal circumstances, irrespective of whether this is on both passenger and cargo aircraft, or only on passenger aircraft, or only for part of the entry (e.g., where there is more than one packing group for an item of dangerous goods and the packing group I entry is forbidden but the other packing groups are permitted).

10.2.2 The dangerous goods list in the Supplement provides information or recommended quantities per package and packing instruction for substances requiring an approval or exemption from the appropriate national authority. Not all of the entries in the list have additional information, eg: Allyl alcohol, UN 1098 still shows only 'Forbidden/Forbidden' in Columns 9 - 12 of the list in the Supplement. This does not mean the Panel intends the item to be totally forbidden but only that no suitable universal packing method and quantity limitation has been established.

10.2.3 Where a quantity is shown in brackets in columns 10 or 12 and special provisions A1 or A2 appear in column 7, it identifies the maximum quantity which qualifies for an approval under those special provisions.

10.2.4 The packing instruction numbers for explosives are shown in brackets in columns 9 - 12.

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PART 11

EMERGENCY RESPONSE GUIDANCE

11.1 Emergency Response Guidance

11.1.1 The Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481 AN/928) is amended to reflect changes to the list of dangerous goods. The amendment cycle follows that for the Technical Instructions.

11.2 Assignment of Emergency Response Drill Codes

11.2.1 Drill codes are assigned to the entries for dangerous goods in the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* on the basis of the following criteria.

a) Drill Code Number

The drill code number assigned is the number of the UN class into which the substance or article has been placed, except that:

1) the drill code number 10 is assigned to flammable gases in Division 2.1 and to toxic gases having a subsidiary hazard of Division 2.1, with all other gases being assigned the drill code number 2;

2) the drill code number 11 is assigned to infectious substances in Division 6.2;

3) the drill code number 12 is assigned to lithium batteries;

4) flammable solids (ie: Division 4.1 substances) are assigned the drill code number 3; drill code number 4 being reserved for spontaneously combustible and water-reactive substances (ie: those in Divisions 4.2 and 4.3); and

5) articles and substances classified in Division 1.4S are assigned to drill code number 3.

b) Drill Code Letter

1) Code letters C, F, P, and X - are assigned to articles and substances required to bear a Corrosive, Flammable, Toxic or Oxidizer subsidiary hazard label, respectively.

(Note - the *code* letter *P is also assigned to toxic gases in Division 2.3)*

2) Code letter E - is assigned to articles and substances to which Special Provision A 215 has been assigned in Table S-2-6 and to desensitised explosives classified in Division 4.1, Packing Group I.

3) Code letter H - is assigned to liquids with a high hazard of ignition by virtue of having a FP below 0ºC. For "nos" or other generalised entries in Class 3, where a separate line entry is presented for packing groups I and II or for all three packing groups, the drill code letter H is indicated for both PG I and II entries, since even

the substances falling into PG II may have flash points below 0ºC. If an "nos" or other generalised entry in Class 3 has only a PG II or III line entry, the H is not indicated for the PG II entry since the flash points would be expected to be relatively high, as evidenced by the absence of a PG I entry.

Note.— The H drill code letter is not assigned to Class 3 entries only. It is also assigned to liquids having a flash point below 0ºC and which are classified in a Class or Division that precedence over Class 3 (e.g. a highly ignitable liquid which has a PG I inhalation toxicity is assigned the drill code 6H).

4) Code letter M - is assigned to Magnetized materials.

5) Code letter S - is assigned to self-reactive and related substances of Division 4.1 and organic peroxides of Division 5.2, which require temperature control in transport; and to solid substances having a subsidiary hazard of Division 4.2; and to explosive articles and substances that are also pyrophoric.

6) Code letter W - is assigned to any article or substance classified in Division 4.3 or having a subsidiary hazard 4.3. Because of the effect of inhalation of a corrosive/toxic gas, it is also assigned to substances which react violently with water to produce corrosive/toxic gases (eg: Phosphorus pentachloride).

7) Code letter Y – is assigned to infectious substances in Category A (UN 2841 and UN 2900.

8) Code letter Z – is assigned to lithium batteries to identify to flight crew that the cargo fire suppression system may not extinguish or contain a fire.

9) Code letter A, i and N - are assigned subjectively to articles and substances for which none of the above code letters apply and which exhibit anaesthetic, irritating (tear-producing) or noxious properties, respectively.

10) Code letter L - is assigned when no other code letter applies to articles and substances having no subsidiary hazard and to all articles and substances classified in Division 1.4S.

Note.— The L drill code *letter does not necessarily mean that the substance to which the code is assigned is of a low hazard, only that there is little of no hazard in addition to that indicated by the basic drill code number. For example, a flammable gas in Division 2.1 would have the drill code 10L assigned. Clearly, such a gas could be very dangerous on an aircraft, but the code letter L only indicates that there is no hazard in addition to that indicated in the Inherent Hazard column of Table 4-1 of Doc 9481 for the drill number 10).*

11.2.2 Not more than 2 drill code letters are used in the drill code. In order to ensure this, it may be necessary to ignore a lesser hazard of a substance having multiple hazards which may, however, require multiple subsidiary hazard labels. For example **Chlorosilanes, water reactive, flammable, corrosive, nos** are required to be labelled with a Danger if wet primary hazard label and subsidiary hazard labels for Liquid flammable and Corrosive; the drill code assigned, however, is **4FW** rather than **4CFW**.

— END —