Note.— Amendments proposed in this report cannot be considered final until the report is approved by the ICAO Council.

TWENTY- FOURTH MEETING OF THE
DANGEROUS GOODS PANEL (DGP) (2013)

LETTER OF TRANSMITTAL

To: President, Air Navigation Commission

From: Chairman, Dangerous Goods Panel (DGP) (2013)

I have the honour to submit the report of the twenty-fourth meeting of the Dangerous Goods Panel (DGP) which was held in Montréal, from 28 October to 8 November 2013.



Geoff Leach
Chairman

Montréal, 8 November 2013

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[*] Recommendations annotated "RSPP" relate to proposals for amendment of Standards, Recommended Practices and Procedures for Air Navigation Services or guidance material in an Annex.

DANGEROUS GOODS PANEL (DGP)

TWENTY-FOURTH MEETING

Montréal, 28 October to 8 November 2013

HISTORY OF THE MEETING

1. DURATION

1.1 The twenty-fourth meeting of the Dangerous Goods Panel (DGP) was opened by Mr. Christian Schleifer, President of the Air Navigation Commission (ANC), in Montréal at 1000 hours on 28 October 2013. The meeting ended on 8 November 2013.

2. ATTENDANCE

2.1 The meeting was attended by members nominated by thirteen Contracting States and two international organizations, as well as by advisers and observers as shown in the list below:

Members	Advisers	Nominated by
B. Firkins	T. Farquharson	Australia
B. Carrara	P. F. Macário	Brazil
M. Paquette	B. Dibacco D. Evans T. Howard G. Sansoucy E. Servant D. Sylvestre	Canada
Q. Xu	J. Abouchaar Y. Li R. Ng (Hong Kong SAR) X. Ni A. Poon (Hong Kong SAR) Z. Qiu K. Wan (Hong Kong SAR)	China
H. Brockhaus	G. Closhen B.-U. Wienecke	Germany

Members	Advisers	Nominated by
H. Sugimoto	A. Awano T. Kiyokawa Y. Nakayama I. Uehara N. Takahashi A. Uchizawa K. Yanagawa	Japan
S-W. Park	D.K. Lee	Korea, Republic of
T. Muller	C. Carboni R. Dardenne D. W. A. Kampman J. Le Tonquèze H. van der Maat K.Vermeersch	Netherlands
M. Evans		New Zealand
D. Mirko	D. Kurdchenko	Russian Federation
H. S. Al Muhairi	K. Al Balooshi S. Al Dhaheri P. Balasubramanian P. King A. Wagih	United Arab Emirates
G. Leach	J. Hart V. Trojanowska D. Warden	United Kingdom
C. Glasow	J. McLaughlin M. Givens R. Hill S. Kelley K. Leary D. Pfund H. Webster	United States
D. Brennan	S. Acton-Gervais P. Liu P. Oppenheimer D. Tindley	International Air Transport Association (IATA)
M. Rogers	S. Schwartz	International Federation of Air Line Pilots' Associations (IFALPA)

Advisers

E. Sigrist	European Chemical Industry Council (CEFIC)
A. Altemos N. McCulloch F. Wybenga	Dangerous Goods Advisory Council (DGAC)

Observers

M. Böehm	Austria
F. H. Carroll	Bahamas
J. W. Bengtsson	Denmark
A. Boulmane	Morocco
N. Lum	Singapore
N. W. Mathonsi	South Africa
P. Ros Prado	Spain
R. Joss	Switzerland
L. Calleja Barcena	European Aviation Safety Agency (EASA)
A. McCulloch B. McClelland	Global Express Association (GEA)
N. Capadona	International Atomic Energy Agency (IAEA)
F. Bognar C. van Zijl	North Atlantic Treaty Organization (NATO)
C. Updyke	National Electrical Manufacturers Association (NEMA)
G. Kerchner	The Rechargeable Battery Association (PRBA)
D. Cortez D. Davies	Universal Postal Union (UPU)
B. Bonnardel-Azzarelli	World Nuclear Transport Institute (WNTI)

3. OFFICERS AND SECRETARIAT

3.1 Mr. Geoff Leach (United Kingdom) was elected Chairman of the meeting and Ms. Janet McLaughlin (United States) was elected Vice-Chairwoman.

3.2 The Secretary of the meeting was Dr. Katherine Rooney, Chief of the Dangerous Goods Section, who was assisted by Ms. Lynn McGuigan, Dangerous Goods Information Officer of the same section.

3.3 Interpretation was provided in Arabic, Chinese, English, French, Russian and Spanish and translation was provided in Arabic, Chinese, English, French, Russian and Spanish. Due to a reduction in resources, interpretation services were reduced by thirty per cent.

4. AGENDA OF THE MEETING

4.1 The agenda for the meeting shown hereunder was approved by the Air Navigation Commission on 21 February 2013.

Agenda Item 1: Development of proposals, if necessary, for amendments to Annex 18 — *The Safe Transport of Dangerous Goods by Air*

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2015-2016 Edition

Agenda Item 3: Development of recommendations for amendments to the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284SU) for incorporation in the 2015-2016 Edition

Agenda Item 4: Development of recommendations for amendments to the *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481) for incorporation in the 2015-2016 Edition

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

- 5.1: Review of provisions for the transport of lithium batteries
- 5.2: Dangerous goods incident and accident data collection
- 5.3: Dangerous goods requirements in Annex 6 — *Operation of Aircraft*
- 5.4: Development of guidance material on countering the potential use of dangerous goods in an act of unlawful interference
- 5.5: Development of performance standards for air operators and designated postal operators

Agenda Item 6: Other business

5. WORKING ARRANGEMENTS

5.1 The panel met as a single body, with ad hoc drafting groups as required. Discussions in the main meeting were conducted in Arabic, Chinese, English, French, Russian and Spanish. The panel met as a working group of the whole and in specialized working groups during sessions where no interpretation was provided. Some working papers were presented in English only. The report was issued in Arabic (narrative only), Chinese, English, French, Russian and Spanish.

6. OPENING REMARKS BY THE PRESIDENT OF THE AIR NAVIGATION COMMISSION

Good morning ladies and gentlemen and welcome to Montreal. Thank you for bringing us this weather. Just two weeks ago we had perfect summer; we were swimming outside in swimming pools. Now it is winter. I think we had fall last Thursday, for one day and that was it.

On behalf of the Air Navigation Commission, let me welcome you to Montreal. It is good to see you again and to have you back here at ICAO Headquarters, your home.

This is the twenty-fourth meeting of the Dangerous Goods Panel.

Let me begin by introducing to you some members of my team. To my right is Mr. James Dow, the Chairman of the ANC Procedural Matters Working Group. There is a good reason for introducing you to him; we are currently working on an update to the panel structure and to the directives for panels. But we will return to that later. There are three other members of the ANC with me today I would like you to meet. They are Mr. Adel Alaufi, Mr. Mervyn Fernando, and Mr. Aleksander Korsakov.

Subsequent to the twenty-third meeting of the panel held in October 2011, the Commission considered your report and recommended that the Council adopt all of your recommendations. The Council adopted unanimously Amendment 11 to Annex 18 on 27 February 2013; the amendment became effective on 15 July 2013 and will become applicable on 14 November 2013. This highlights how long the process actually takes from the time you recommend amendments to the ANC to the time it takes to go through the ANC and Council process, for the Council to adopt the amendment, and for it to go through an internal process which results in delivery to States with an effective date and an applicability date. For Amendment 11 to Annex 18 to become applicable next month, your proposals needed to be presented to the ANC for preliminary review in spring 2012. I wanted to remind you how long the process takes.

The Council also approved the amendments for the 2013 to 2014 Edition of the Technical Instructions, applicable from 1 January 2013, as well as three addenda related to aircraft batteries, fuel cells and various editorial amendments.

Since the twenty-third meeting, we approved a number of changes in membership. Ms. McLaughlin, Mr. Koume and Mr Tusek have been replaced by Mr. Glasow nominated by the United States, Mr. Sugimoto nominated by Japan, and Mr. Firkins nominated by Australia. The Commission is grateful for the contributions of the outgoing members; they have made an extreme contribution to the overall work of this panel. I have sent letters to thank each member individually.

The work of each member on the panel is highly appreciated by the Commission. I would particularly like to thank Ms. McLaughlin for her contribution to the development of dangerous goods Standards in Annex 6 and Mr. Leach for his contribution to the Joint Task Force of the Dangerous Goods and Aviation Security Panels as well as Mr. Teun Muller for his contribution to the development of competency training Standards. This shows that we are working more and more and overlapping with other panels. This panel's work with AVSECP and OPSP has set an example of how to ensure that overlaps are addressed correctly.

During the next two weeks, you will meet as a panel of experts. I would like, as usual, to remind each member that you are here in a personal capacity representing your own expertise, which may not necessarily be those of your administration or organization. Although you have been nominated by your government or organization, you have been accepted by the Air Navigation Commission as an expert in the field of dangerous goods based on your submitted CV and, therefore, you are expected to express your own professional opinions. I also want to remind you that the ANC would like to have consensus-driven solutions and outcomes. This will help ensure that amendments are processed and then implemented effectively at the State level.

Your first task is to develop proposals for any necessary amendments to Annex 18. Many national aviation administrations feel strongly that the Annexes to the Convention should be stable documents. Accordingly, the ICAO Council has directed us that, with the exception of overriding issues such as safety or efficiency, there should be a minimum three-year cycle between Annex amendments. I note that the first edition of Annex 19 — *Safety Management* will become applicable on 14 November 2013. The Commission will therefore be very interested in your discussions on incorporating a reference to safety management systems into Annex 18.

The second task of this meeting is to recommend necessary revisions to the Technical Instructions for incorporation into the 2015 to 2016 Edition. Please, remember the word "necessary" and I ask you all to bear in mind that every change imposes some burden on those who have to use this document. Having said that, I realize that the vast majority of amendments arise from aligning the Technical Instructions with the United Nations Recommendations which, in the interests of multimodal harmonization, is essential.

The final agenda item concerns the various non-recurrent tasks which have been identified by the Commission and by the panel. I look forward to hearing the outcome of your discussions, especially on lithium batteries, a subject in which the Commission is most interested. The Commission is grateful for the work you have already done with the Operations Panel to reinforce dangerous goods provisions in Annex 6. The proposed Standards and guidance material you developed have been recognized as a significant contribution to safety. They will help ensure that all operators are aware that they have responsibilities related to dangerous goods, regardless of whether or not they are approved to carry them. The amendments were transmitted to Contracting States and appropriate international organizations for comments. A final review of these amendments will be carried out in November during the current session of the ANC.

The Air Navigation Commission and the Council have, with Annex 18 and the Technical Instructions, set the broad structure for ensuring that dangerous goods are transported safely. To collect and organize the myriad details of the Technical Instructions is your task; this requires that you ensure that they are accurate, complete, understandable and practical. The Commission is confident that you will maintain the high standards you have shown at previous meetings. Should you require any assistance in your work, I trust your chairman will not hesitate to call upon the Secretariat or myself. In any case, we

will meet again towards the end of your panel meeting in a debriefing to discuss your achievements. The Commissioners and I look forward to listening to you on that occasion.

It remains for me to declare open the twenty-fourth meeting of the Dangerous Goods Panel and to wish you every success in your work and a pleasant stay in Montréal.

7. ADDITIONAL REMARKS FROM THE PRESIDENT OF THE AIR NAVIGATION COMMISSION AND BY THE CHAIRMAN OF THE ANC WORKING GROUP ON PROCEDURAL MATTERS ON THE RESTRUCTURING OF ANC PANELS

7.1 The President of the ANC informed the panel of work the ANC was undertaking to restructure the organization of panels. He stressed that no changes were anticipated to the structure of the DGP, a specialized panel, but that there would be changes to the Directives for Panels of the Air Navigation Commission (Doc 7984). He invited Mr. Dow, in his capacity as Chairman of the ANC Working Group on Procedural Matters (ANC-WG/PM), to provide a summary of anticipated changes to this document. Before the Chairman spoke, the President of the ANC complimented the DGP on the manner in which it had conducted itself over the years and also on how the Secretary had effectively acted as a liaison between the panel and the ANC.

7.2 The Chairman of the ANC-WG/PM explained that panels of the ANC were expected to conduct their work in accordance with the Directives for Panels of the Air Navigation Commission (hereafter referred to as “Directives”). There had been four editions to these Directives; the first was published in 1959, the second in 1962, the third in 1970, and the current in 1980. He then outlined some of the changes that would be incorporated in the new edition. These included provisions for observers to be designated to the panel and not to just one meeting, and also for chairpersons to be elected for a period of time instead of for just one meeting. He noted that since their inception, much of the work of panels had been done through correspondence. The new Directives would encourage the continued use of correspondence and introduce the use of modern technology to efficiently and effectively collaborate and communicate between and during meetings.

7.3 The Chairman explained how the ANC was working closely with the Air Navigation Bureau and with panel secretaries to determine where there was room for improvement. The Commission was also collaborating with interpreters, editors and anyone they believed could help improve the Directives. It was anticipated that the new Directives would include guidance material in appendices on how to work with interpretation.

7.4 It was anticipated, subject to Council approval, that the fifth edition would be published in 2014.

8. REMARKS FROM THE DIRECTOR OF THE AIR NAVIGATION BUREAU

8.1 Ms. Nancy Graham, Director of the Air Navigation Bureau (D/ANB), provided insight into the Secretariat’s growing concern with cargo safety and how the mandate of the Dangerous Goods Section would expand and be renamed to the Cargo Safety Section. The exact mandate and scope of the

section had yet to be established, but a new technical officer with expertise in cargo safety would be recruited. She encouraged panel members to share their views with the Secretary on what the mandate of the Cargo Safety Section should be.

8.2 D/ANB also thanked the panel for their efforts in promoting safety. She was aware of the panel's on-going and complicated discussions on lithium batteries. She reminded the panel that although there was a commercial element to the transport of lithium batteries, safety needed to be the deciding factor at all times.

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Agenda Item 1: Development of proposals, if necessary, for amendments to Annex 18 — *The Safe Transport of Dangerous Goods by Air*

1.1 STATE OF OVERFLIGHT IN THE EXEMPTION PROCESS — INFORMATION ON NATIONAL AUTHORITIES FOR DANGEROUS GOODS (DGP/24-WP/7)

1.1.1 The subject of difficulties encountered by shippers or operators when attempting to obtain an exemption from States of Overflight had been discussed at length at DGP/23 (Montréal, 11 to 21 October 2011), at the Working Group of the Whole on Lithium Batteries Meeting (Montréal, 6 to 10 February 2012), at the 2012 Meeting of the Working Group of the Whole (Montréal, 15 to 19 October 2012) and through correspondence. Removing State of Overflight from the exemption process had been seen by many to be the only solution to this problem, but this was not considered to be an option as it would infringe on a State's sovereign right over its airspace, a fundamental tenet of the Chicago Convention. The Legal Bureau had offered potential solutions, but it was recognized that any possible solution would involve communication with national authorities responsible for compliance with Annex 18. However, obtaining information on national authorities responsible for compliance with Annex 18 was often difficult, if not impossible, and was cited as a major hurdle in obtaining exemptions.

1.1.2 The Secretariat informed the meeting that, with the assistance of the ICAO regional offices, concerted efforts to obtain this information from all States had been made. This resulted in the development of a public website containing State authority contact information (www.icao.int/safety/DangerousGoods/Pages/Dangerous-Goods-National-Authority.aspx). It was envisaged that this website would not only provide invaluable information but would also serve as an impetus to States which had not already notified ICAO of an appropriate authority to do so, as required by Annex 18, paragraph 2.7 and as detailed in Part S;1.1.1 of the Supplement to the Technical Instructions.

1.1.3 Panel members expressed their appreciation and support for the work undertaken. Several suggestions for improving the site were offered. These included a reference to the Annex 18 Standard which required States to provide contact information and the addition of an on-line form to assist States in providing it. It was noted that many States provided specific names of people responsible for dangerous goods and that these names often became outdated. It was suggested that the Secretariat should encourage States to provide a general phone number and e-mail address which would not change with changes in personnel.

1.1.4 The Secretary reported that the Secretariat would continue efforts to ensure States provide up-to-date information on national authorities responsible for compliance with Annex 18. It was hoped that these efforts would result in reliable and complete information which will assist efforts to find an effective solution to the State of Overflight problem.

1.2 SAFETY MANAGEMENT SYSTEMS (DGP/24-WP/10)

1.2.1 An amendment to the compliance chapter (Chapter 11) in Annex 18 which would require States to establish safety programmes for dangerous goods in accordance with Annex 19 — *Safety*

Management and to require operators to implement safety management systems (SMS) acceptable to the State of the Operator was proposed. Definitions for "safety management system" and "State safety programme", which are currently contained in Annex 19, were also proposed for inclusion in Annex 18.

1.2.2 Before presenting the proposal, officers from the Integrated Safety Management Section (ISM) provided background information on the development of Annex 19 and future plans to enhance its safety management provisions. Work was being done by the Safety Management Panel (SMP) to elaborate recommendations related to the possible extension of the SMS framework to additional categories of aviation activities or service providers. The DGP took advantage of the fact that the SMP was meeting as a Working Group of the Whole (SMP/WG/WHL/02, Montréal, 4 to 8 November 2013) during the second week of DGP/24 and asked for guidance on whether SMS provisions related to dangerous goods should somehow be included in Annex 18, Annex 6 and/or Annex 19.

1.2.3 The panel was provided with a working paper prepared for SMP/WG/WHL/02 on the applicability of SMS SARPs and an assessment of SMS extension candidates, including dangerous goods. The outcome of that assessment was a recommendation not to extend the SMS applicability of dangerous goods to service providers and other parties in the supply chain, as the risks entailed would be more adequately managed at the operator level. This recommendation aligned with outcomes of previous DGP discussions whereby the panel believed that SMS for dangerous goods would be covered by the SMS of the operator.

1.2.4 There was some discussion on whether SMS should be required for entities beyond the operator such as ground handling agents, shippers and freight forwarders. The majority believed, however, that although a risk-based management approach by entities such as shippers and freight forwarders should be encouraged, requiring SMS would not be feasible on the basis that there was no certification process for them.

1.2.5 A revised proposal was presented which took into account the recommendation from SMP/WG/WHL/02 and the panel's discussion. Based on the conclusion that SMS for dangerous goods would be covered by the SMS of the operator, it was decided that any references to SMS should be included in Chapter 8 (Operator's Responsibilities) of Annex 18. Two notes were proposed for inclusion at the beginning of that chapter — the first a reference to Annex 19 and the second a statement indicating that the safety management systems of an operator included dangerous goods. The second note was also proposed for inclusion in Chapter 3 (State Safety Management Responsibilities), paragraph 3.1.3 of Annex 19 under the operator's requirement to implement an SMS. A suggestion from the Secretary of the SMP to also include the proposed note in Chapter 4 (Safety Management System (SMS)) under paragraph 4.1.3 was agreed.

1.2.6 **Recommendation**

1.2.6.1 In light of the foregoing discussion, the meeting developed the following recommendation:

RSPP **Recommendation 1/1 — Amendment to incorporate references to safety management system (SMS) requirements into Annexes 18 and 19**

That comments from States be sought on a proposed amendment to Annexes 18 and 19 related to SMS as presented in Appendices A and B to the report on this agenda item.

1.3 DANGEROUS GOODS IN THE MAIL (DGP/24-WP/66)

1.3.1 A proposal to replace the recommendation for States to establish procedures for controlling the introduction of dangerous goods into air transport through the post into a Standard was made (paragraph 11.4 of Annex 18). It was noted that cooperation and coordination between ICAO and the Universal Postal Union (UPU) and between designated postal operators (DPOs) and civil aviation administrations (CAAs) had improved since the requirement for procedures of DPOs to be reviewed and approved by CAAs was added to the Technical Instructions. It was suggested that replacing the recommendation with a Standard would further emphasize the need for close cooperation and coordination.

1.3.2 The amendment was supported, subject to editorial amendments to the proposed new note which would become a recommendation.

1.3.3 Recommendation

1.3.3.1 In light of the foregoing discussion, the meeting developed the following recommendation:

RSPP **Recommendation 1/2 — Amendment to the requirements for dangerous goods in the mail in Annex 18**

That comments from States be sought on a proposed amendment to Annex 18 related to dangerous goods in the mail as presented in Appendix C to the report on this agenda item.

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APPENDIX A

PROPOSED AMENDMENT ANNEX 18 TO INCORPORATE REFERENCES TO SAFETY MANAGEMENT SYSTEMS

ANNEX 18 — *THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR*

DGP/24-WP/10, paragraph 1.2 of this report

. . .

CHAPTER 1. DEFINITIONS

. . .

Definition from Annex 19:

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

. . .

CHAPTER 8. OPERATOR'S RESPONSIBILITIES

Note 1.— Annex 19 includes safety management provisions for air operators. Further guidance is contained in the Safety Management Manual (SMM) *(Doc 9859).*

Note 2.— The carriage of dangerous goods is included in the scope of the operator's safety management system (SMS).

. . .

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APPENDIX B

PROPOSED AMENDMENT TO ANNEX 19 TO INCORPORATE REFERENCES TO SAFETY MANAGEMENT SYSTEMS

ANNEX 19 — *SAFETY MANAGEMENT*

DGP/24-WP/10, paragraph 1.2 of this report

. . .

CHAPTER 3. STATE SAFETY MANAGEMENT RESPONSIBILITIES

. . .

3.1 State safety programme (SSP)

. . .

3.1.3 As part of its SSP, each State shall require that the following service providers under its authority implement an SMS:

a) approved training organizations in accordance with Annex 1 that are exposed to safety risks related to aircraft operations during the provision of their services;=

b) operators of aeroplanes or helicopters authorized to conduct international commercial air transport, in accordance with Annex 6, Part I or Part III, Section II, respectively;

Note 1.— When maintenance activities are not conducted by an approved maintenance organization in accordance with Annex 6, Part I, 8.7, but under an equivalent system as in Annex 6, Part I, 8.1.2, or Part III, Section II, 6.1.2, they are included in the scope of the operator's SMS.

Note 2.— The carriage of dangerous goods in accordance with Annex 18 — The Safe Transport of Dangerous Goods by Air *is included in the scope of the operator's SMS.*

. . .

CHAPTER 4. SAFETY MANAGEMENT SYSTEM (SMS)

4.1 General

. . .

4.1.3 The SMS of a certified operator of aeroplanes or helicopters authorized to conduct international commercial air transport, in accordance with Annex 6, Part I or Part III, Section II, respectively, shall be made acceptable to the State of the Operator.

Note 1.— When maintenance activities are not conducted by an approved maintenance organization in accordance with Annex 6, Part I, 8.7, but under an equivalent system as in Annex 6, Part I, 8.1.2, or Part III, Section II, 6.1.2, they are included in the scope of the operator's SMS.

Note 2.— The carriage of dangerous goods in accordance with Annex 18 is included in the scope of the operator's SMS.

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APPENDIX C

PROPOSED AMENDMENT TO THE REQUIREMENTS FOR DANGEROUS GOODS IN THE MAIL IN ANNEX 18

CHAPTER 11. COMPLIANCE

. . .

11.4 Dangerous goods by mail

DGP/24-WP/66, paragraph 1.3 of this report

~~**Recommendation.**~~ Each Contracting State ~~should~~ shall establish procedures with a view to controlling the introduction of dangerous goods into air transport through its postal services.

*~~Note~~***Recommendation.**— ~~*International*~~ *In establishing these procedures, each State should consider those established by the Universal Postal Union for controlling the introduction of dangerous goods into air transport through the postal services ~~have been established by the Universal Postal Union~~.*

— — — — — — — —

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2015-2016 Edition

2.1 AMENDMENTS TO PART 1 OF THE TECHNICAL INSTRUCTIONS: GENERAL

2.1.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 1 (DGP/24-WP/11)

2.1.1.1 The meeting reviewed amendments to Part 1 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals (subsequently referred to in the report, for the sake of brevity, as "UNCOE") at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13. It was noted that further corrections to the 18th Revised edition of the UN Model Regulations had been made by the UN Sub-Committee of Experts on the Transport of Dangerous Goods (subsequently referred to in the report for the sake of brevity as "the UN Sub-Committee") at its forty-third session (Geneva, 24 to 28 June 2013). The Secretariat would incorporate these corrections in the Technical Instructions, when applicable.

2.1.1.2 The meeting discussed whether a new definition for large salvage packagings which had been added to the UN Model Regulations should be added to the Instructions. Large packagings were not permitted in air transport, and it had been the general philosophy of the panel not to include definitions for items not so permitted. A cross reference to the UN Model Regulations was instead provided next to such terms. However, many felt there was justification in adding a definition for large salvage packagings so that "large" could be quantified. It was then questioned whether definitions should be included for all terms, regardless of whether they were items permitted for air transport or not. Some believed they should be, with the words "Not permitted for air transport" appearing after the definition. Others believed the words were not necessary on the basis that these were purely definitions and whether or not they were permitted would be specified elsewhere in the Instructions. It was also pointed out that certain terms might refer to items that could be permitted under an exemption or an approval and therefore a definition would be justified.

2.1.1.3 It was noted that some provisions in Parts 5 and 7 which applied to the transport of excepted packages of radioactive material were not included with the list of references in Part 1;6.1.5.1 a), and some that were included introduced contradictions. Revisions to the list of references were made accordingly. It was noted that some requirements for excepted packages of radioactive material which were contained in Part 4 were not referenced in 1;6.1.5.1 a) because of the preamble to sub-paragraph a) which specified Parts 5 to 7 only.

2.1.1.4 One panel member suggested that the requirements in 1;6.6 related to informing of non-compliance with limits in the Instructions applicable to radiation level or contamination and the actions to be taken in these cases placed an unachievable burden on the consignee. Others felt that in the case of consignments of radioactive material, the consignee would be an organization or person sufficiently knowledgeable to comply with the requirements and that they were therefore appropriate. It was suggested that if the panel felt it necessary, the issue could be brought to the attention of the UN Sub-Committee with the recognition that the text originated in the International Atomic Energy Agency (IAEA) *Regulations for the Safe Transport of Radioactive Material, Specific Safety Requirements* (Series

No. SSR-6) (subsequently referred to in this report, for the sake of brevity, as IAEA SSR-6). However, since no other concerns were raised, no further action was taken.

2.1.2 **Lamps Containing Dangerous Goods (DGP/24-WP/43)**

2.1.2.1 It was suggested that the proposed introduction of new provisions for lamps containing dangerous goods in Part 1;2.6 which was made for the sake of alignment with the UN Model Regulations (see DGP/24-WP/3) would introduce contradictions and inconsistencies between other provisions in the Technical Instructions which could lead to confusion. Amendments which would remove these contradictions and inconsistencies were therefore proposed as described below.

a) It was suggested that the new provision in Part 1;2.6 a) making lamps not subject to the Instructions was not applicable to air transport and were mainly a concern for the surface mode. In addition, the transport of used, damaged and defective lamps from a collection or recycling facility in Part 1;2.6 c) did not seem to fit with the philosophy of the Technical Instructions. It was therefore proposed that paragraphs Part 1;2.6 a) and c) (as presented in DGP/24-WP/3) should not be adopted.

b) It was noted that Special Provision A69, sub-paragraph b) imposed a drop test from a height of not less than 0.5 m for lamps containing mercury. The UN Model Regulations did not have this specific requirement for lamps containing mercury, but a 1.2 m drop test was introduced with the introduction of new Part 1;2.6 for all packages containing lamps. Special Provision A69 sub-paragraph b) also imposed limits on the mercury content of a lamp which was identical to those included in new Part 1;2.6. It was therefore proposed to delete sub-paragraph b) from Special Provision A69.

c) It was suggested that references to “articles” in Special Provision A69 c) might introduce contradictions with other text within the Instructions when the article was a lamp. For example, in accordance with this special provision a light bulb containing an inert gas such as Neon was limited to 100 mg while Part 2;2.2.3 d) stated that light bulbs containing Division 2.2 gases were not subject to the Instructions provided they were packaged so that the projectile effects of any rupture of the bulb would be contained within the package. It was therefore proposed to exclude lamps from the provisions of sub-paragraphs a) and c).

d) a note referring to the provisions for lamps in Part 1;2.6 was proposed for inclusion under Special Provision 69.

e) to align with the UN Model Regulations, the provision in 2;2.2.3 d) making light bulbs containing Division 2.2 gas not subject to the Instructions was copied to new 1;2.6 b).

f) references to “light bulbs” would be replaced with “lamps” throughout the Instructions.

The amendments were agreed.

2.1.3 **Ice Jam Control — Proposal to Amend 1;1.1.5.1 c) (DGP/24-WP/67)**

2.1.3.1 An amendment to the general exceptions in Part 1;1.1.5.1 was proposed in order to allow for dropping in connection with ice jam control. It was reported that explosives were used to penetrate ice jams so as prevent the risk of severe flooding in adjacent areas. It was noted that explosives were also used for avalanche control for which provision was made in the 2013-2014 Edition of the Technical Instructions.

2.1.3.2 Although the proposal was supported, much discussion was directed at whether the general exceptions would only apply while the dangerous goods were being dropped or if they would also apply during their transport to the dropping destination. There were cases where these dangerous goods would need to be transported long distances to their destination and might not be actually dropped during the same flight. It was agreed that in cases such as these the exception should not apply during transport to the destination and the goods should be transported in accordance with the Instructions. However, the panel could not come to an agreement on how this should be addressed and, bearing in mind that this was a separate issue to the one presented in the proposal, it was agreed that it would be considered during the next biennium.

2.1.3.3 The amendment was agreed, subject to the addition of "landslide clearance" to the list of exceptions in 1;1.1.5.1 c).

2.1.4 **Definition of "Dangerous Goods Training Programme (DGP/24-WP/78)**

2.1.4.1 The meeting was asked to consider what constituted a training programme. It was noted that the term was used in Annex 18 and the Technical Instructions but was not defined. The panel was asked to consider whether a definition should be introduced to clarify this. Was it just the actual training or did it include everything related to training such as the training required to be undertaken by each category of employee, the induction process for employees, the test to verify understanding, the management of employees who failed to demonstrate understanding and the process of determining the scheduling of initial and recurrent training?

2.1.4.2 While some members believed a definition would clarify what was required by States others felt that the proposed definition was too detailed. There was also concern that any definition would be premature on the basis that work on competency based training was not yet complete.

2.1.4.3 The panel felt that no definition was required.

2.2 AMENDMENTS TO PART 2 OF THE TECHNICAL INSTRUCTIONS: CLASSIFICATION OF DANGEROUS GOODS

2.2.1 **Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 2 (DGP/24-WP/12, Revised)**

2.2.1.1 The meeting reviewed amendments to Part 2 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.**

2.2.1.2 It was noted that the UN Model Regulations referred to “Human or animal” specimens in 2;6.3.2.3.6 (renumbered to 2;6.3.2.3.8), while the Instructions referred to “Patient” specimens. Although an amendment to the Instructions had been proposed for the sake of alignment with the Model Regulations, it was decided that “Patient” specimens should be retained and that the UN Sub-Committee should be advised accordingly. The term “patient specimens” was used in other parts of the Instructions and was defined in 2;6.3.1.4. The definition referred to both human and animal, making the wording in 2.6.3.2.3.8 of the Model Regulations redundant.

2.2.1.3 Several new references to unpackaged fissile material had been added to the Model Regulations. It was agreed that these references should be deleted on the basis that unpackaged radioactive material was not permitted for air transport.

2.2.1.4 A gap was identified between 2;7.2.3.3.6 a) i) which referred to radioactive material less than 200 g and 2;7.2.3.3.6 a) ii) which referred to radioactive material more than 200 g. To remove this gap, “more than 200 g” was replaced with “200 g or more” in 2;7.2.3.3.6 a) ii).

2.2.1.5 It was proposed to include a reference to the new entry for **Uranium hexafluoride, radioactive material, excepted package** (UN 3507) in Part 2;8 since it was classified as corrosive. This was not agreed on the basis that it would be inconsistent with the UN Model Regulations.

2.2.2 Requirements for Medical Devices or Equipment (DGP/24-WP/6)

2.2.2.1 An amendment intended to address concerns raised at DGP/23 (see paragraph 2.3.5 of the DGP/23 Report) with provisions introduced into the Model Regulations related to medical devices and equipment potentially contaminated with or containing infectious substances was proposed to the meeting.

2.2.2.2 One of the concerns related to the UN requirement for packaging to be capable of withstanding a 1.2 metre drop and whether or not this was feasible for large and/or expensive equipment (Part 2;6.3.2.3.7.1 of the Technical Instructions). The proposer suggested that the UN Sub-Committee did not intend for consignors to drop test medical equipment with values in excess of a million dollars to demonstrate compliance with this requirement, but recognized that the requirement might nevertheless be enforced by regulators. To address this without altering the UN text, the proposer suggested the addition of more stringent packaging requirements in the Technical Instructions and an indication that packaging meeting these new requirements would be deemed of being capable of meeting the 1.2 metre drop capability requirement. The additional packing requirements would also address concerns that the UN text did not preclude medical equipment that had the potential for puncturing the packaging.

2.2.2.3 The panel was reminded that the decision to add the provisions to the UN Model Regulations was to allow for the transport of large pieces of equipment that contained or potentially contained infectious substances which, due to the size of the equipment, were difficult to purge. There was general agreement that the intent was never to require the actual dropping of large, often extremely expensive equipment but rather to ensure that if it were dropped, the dangerous goods would be retained and there would be no leakage. The panel did not believe, however, that allowing an exception from the drop capability requirement provided additional requirements were met was appropriate. There were also concerns that the provisions would be applied to smaller pieces of equipment and not to the larger equipment for which the provision was intended.

2.2.2.4 A revised amendment which eliminated the original proposal's exception from the drop capability requirement while retaining some of the more stringent packaging requirements and adding a new note describing what would constitute *capable of* retaining the medical devices and equipment when dropped from a height of 1.2 m was agreed.

2.2.3 **Refrigerant Material with Patient Specimens** (DGP/24-WP/24)

2.2.3.1 A proposal was presented at DGP-WG/13 to permit dry ice in the mail when used as a refrigerant for patient specimens (see paragraph 3.2.14 of the DGP-WG/13 Report (DGP/24-WP/3)). It was noted that this was permitted for infectious substances assigned to Category B packed in accordance with Packing Instruction 650. It was reported that the transport of some substances classified as exempt patient specimens needing refrigeration was very common. Some could be transported using reusable gel ice packs but others, such as plasma, needed dry ice. An amendment to Part 1;2.3.2 a) was proposed along with new requirements in Part 2;6.3.2.3.6 for triple packaging. Although there was support for the intent of that proposal, it was felt additional requirements needed to be considered. It was decided that the issue would be discussed at a joint DGP/Universal Postal Union (UPU) meeting which was to be held in Bern, Switzerland on 29 June 2013).

2.2.3.2 A new proposal was presented to DGP/24 which added requirements to Part 2;6.3.2.3.6 for packing patient specimens with refrigerant material. The proposal did not include provisions for dry ice in the mail, as little progress was made on this subject at the joint DGP/UPU meeting.

2.2.3.3 The panel was comfortable with new text added to 2.3.2 a) which excluded patient specimens packed with refrigerant material from transport in the mail. Concerns were expressed, however, that the text as written might be interpreted to mean that dry ice was not regulated. A revised proposal addressing this concern was agreed.

2.2.4 **Identification of Net Quantity Limits Applicable to Viscous Flammable Liquids Assigned to Packing Group III (DGP/24-WP/32)**

2.2.4.1 Part 2;3.2.2 of the Technical Instructions sets out criteria by which a shipper may assign a viscous flammable liquid to Packing Group III even if the flash point meets the criteria for Packing Group II. The criteria included distinct maximum net quantities of flammable liquids per package limits for passenger and cargo aircraft. It was proposed that text be introduced into Part 2;3.2.2 to require the shipper to note on the dangerous goods transport document that the substances had been assigned to Packing Group III when the provisions of 2;3.2.2 had been applied. This would provide a mechanism for operators to verify that the net quantity per package was within the quantity limits.

2.2.4.2 A note under the new text was also proposed to indicate that when these dangerous goods were packed in the same outer packaging as other dangerous goods, the divisor used for the "Q" value calculation would be 30 or 100, as applicable.

2.2.4.3 Although there was some support for the note related to the "Q" value, there was little support for the text requiring the shipper to note on the dangerous goods transport document that the substances had been assigned to Packing Group III when the provisions of 2;3.2.2 had been applied. Classifying the substance was the shipper's responsibility, and most did not see value in adding the text to the transport document. The amendment was not agreed.

2.2.5 Transport of Empty Type B (U) or Type B(M) Packages (DGP/24-WP/61)

2.2.5.1 At DGP-WG/13, it was agreed to add a new note under Part 2;7.2.4.1.1.5 (renumbered 2;7.2.4.1.1.5.7 in the appendix to the report on this agenda item) to explain that an empty package of radioactive material might exceed the 5 μSv/h permitted for classification as an excepted package due to the presence of depleted uranium in the shielding material, and it would therefore be classified either as low specific activity material (LSA-I) or as a Type B(U) or Type B(M) package.

2.2.5.2 It was suggested that an empty package of radioactive material might also exceed the 5 μSv/h permitted for classification as an excepted package due to residual contamination or activation in the internal part of the packaging. It was suggested that this possibility should be added to the note and an amendment was proposed. Editorial amendments to the note were also proposed for the sake of clarity.

2.2.5.3 The amendment was not supported on the basis that the original amendment proposed at DGP-WG/13 was intended to clarify and facilitate current practices but that the additional amendments proposed in DGP/24-WP/61 altered IAEA provisions.

2.3 AMENDMENTS TO PART 3 OF THE TECHNICAL INSTRUCTIONS: DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

2.3.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 3 (DGP/24-WP/13, Revised)

2.3.1.1 The meeting reviewed amendments to Part 3 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.**

2.3.1.2 The following revisions would be made to Table 3-1:

a) “electrically initiated” was incorrectly included as part of the proper shipping name for UN 3268 — this would be corrected;

b) Since a radioactive material label was not required for UN 3507, text in column 5 would be deleted accordingly; and

c) “A2” would be assigned to column 7 for all adsorbed gases which were forbidden on cargo aircraft.

2.3.2 Radiation Detectors Containing Division 2.2 Gases (DGP/24-WP/5)

2.3.2.1 The meeting was informed of a decision by the UN Sub-Committee at its 43rd Session to incorporate requirements for Division 2.2 gas radiation detectors in the 19th revised Edition of the Model

Regulations. It was noted that the UN Sub-Committee agreed to treat these detectors in the same manner as detectors containing UN 1008 — **Boron trifluoride** (see Special Provision A190) were treated.

2.3.2.2 Under the normal amendment cycle, the DGP would consider incorporating these requirements in the 2017-2018 Edition of the Technical Instruction. It was proposed, however, that they instead be adopted in the 2015-2016 Edition so as to avoid the need to transport these devices under approvals by national authorities. The meeting was reminded that requirements for radiation detectors containing boron trifluoride were included in the Technical Instructions in advance of consideration by the UN Subcommittee. It was argued that a similar approach could be taken for radiation detectors containing Division 2.2 gas. The requirements were included in a new special provision assigned to UN 1006 — **Argon, compressed**; UN 1013 — **Carbon dioxide**; UN 1046 — **Helium, compressed**; UN 1056 — **Krypton compressed**; UN 1065 — **Neon, compressed**; UN 1066 — **Nitrogen, compressed**; UN 1956 — **Compressed gas, n.o.s.***; and UN 2036 — **Xenon**.

2.3.2.3 Although there was no objection to the amendment proposed, the panel did not see justification in incorporating the requirements in the Instructions before they were incorporated in the UN Model Regulations. It was recognized that the same approach had been taken with respect to the incorporation of radiation detectors containing boron trifluoride in the 2013-2014 Edition of the Instructions, but that decision was based on safety. Since no safety case was presented to justify incorporating radiation detectors containing Division 2.2 gases, the panel could not support the proposal. The amendment was not agreed.

2.3.3 Verification of Quantity Limits Applied by Special Provisions A4 and A5 (DGP/24-WP/27)

2.3.3.1 The meeting was presented with a proposal to add text to Special Provisions A4 and A5 requiring shippers to clearly indicate on the dangerous goods transport document when the limitations set out in A4 and A5 applied and for this to be indicated on the dangerous goods transport document. These special provisions allowed for the transport of liquids having a mist inhalation toxicity of Packing Group I and solids having an inhalation toxicity of Packing Group I on cargo aircraft within certain net quantity limits, provided they were packed in accordance with the packing instructions for the Packing Group I substance. The additional text would provide a mechanism for operators to verify that the net quantity per package was within the more restrictive net quantity limits.

2.3.3.2 The amendment was agreed.

2.3.4 Special Provision A131 (DGP/24-WP/28)

2.3.4.1 Special Provision A131 was assigned against UN 1040, **Ethylene oxide** to permit small quantities of ethylene oxide for use in sterilization devices to be shipped under the provisions for dangerous goods in excepted quantities, notwithstanding that UN 1040 as a Division 2.3 gas is forbidden on both passenger and cargo aircraft. A proposal to amend the phrase “irrespective of the indication of “E0” in column 9 of the Dangerous Goods List (Table 3-1)” so as to remove the reference to “E0” in column 9 was agreed on the basis that “E0” did not appear in column 9 for UN 1040; column 9 was blank.

2.3.4.2 The amendment was agreed, subject to an editorial amendment which would also apply to Special Provision A75.

2.3.5 UN Numbers not Included in the List Of Dangerous Goods (DGP/24-WP/45, Revised)

2.3.5.1 The meeting was asked to consider adding entries to Table 3-1 which, although assigned UN numbers and listed in the UN Model Regulations, were not currently listed in the Instructions. It was suggested that their absence in the Instructions was based on the belief that there would never be a need to transport the items by air. However, enquiries about the air transport of some of these items had been received in some States. In order to eliminate the potential for confusion, it was proposed to add these items to the Technical Instructions. It was recognized that some of the items should be forbidden for transport by air and others, while considered dangerous goods by other modes of transport, might not be considered dangerous when transported by air. The following amendments were proposed and agreed:

a) most of the entries not included in the Instructions were unstabilized substances of Division 4.2, in Packing Groups II and III; it was proposed to add these substances to Table 3-1 and to forbid them on both passenger and cargo aircraft but to assign Special Provision A2 to allow for their transport on cargo aircraft with prior approvals from the relevant States;

b) it was suggested that UN 1327 (**Hay**, **Straw** or **Bhusa**) was not dangerous when not wet, damp or contaminated with oil and a new special provision to this effect, based on special provision 281 of the UN Model Regulations, was proposed for these substances;

c) the UN assigns a special provision (SP300) to UN 2216 (**Fish meal** and **fish scrap**) and UN 3497 (**Krill meal**) which forbids transport if the temperature at the time of loading exceeds certain levels. It was therefore proposed to add these substances to Table 3-1 as forbidden for transport on both passenger and cargo aircraft but to assign Special Provision A2 which would allow for their transport on cargo aircraft with prior approvals from the relevant States.

d) it was proposed to forbid UN 3359 (**Fumigated transport unit**) from transport under any circumstances as it was possible for these units to contain small amounts of toxic gases which could be released during transport;

e) recognizing that UN 3496 (**Batteries, nickel-metal hydride**) were only regulated for sea transport, it was suggested that conditions under which these batteries could be transported by air be included in a new special provision. This was consistent with the manner in which certain batteries assigned Special Provision A123 were treated. Special Provision 123 could not be applied to UN 3496 because this special provision applied to batteries not listed in the Technical Instructions.

f) The new entry for UN 3509 — **Packaging discarded, empty, uncleaned** which was introduced in the 18th Revised Edition of the UN Model Regulations was added as forbidden for transport on both passenger and cargo aircraft and new Special Provision A227 was assigned to it (see paragraph 3.1.2 of the Report on Agenda Item 3).

2.3.6 **Special Provision A123 (DGP/24-WP/48)**

2.3.6.1 An amendment to Special Provision A123 was proposed to alter the current requirement for the words "not restricted" and the special provision number to appear on the air waybill, so that it would only apply to batteries where the voltage exceeded 9 volts. It was noted that the special provision applied to "Batteries, electric storage" which were widely available to consumers for devices such as flashlights, toys, games and smoke detectors. It was argued that many of these batteries posed little to no risk in transport and that the documentation requirement was unjustified. The remaining conditions for the batteries to be protected from short circuits and the devices to be protected from unintentional activation would remain.

2.3.6.2 There was little support for the proposal on the basis that it would further complicate acceptance. The paper was withdrawn.

2.3.7 **Requirements for Excepted Quantities Provisions Regarding the Use of Absorbent and Cushioning Material (DGP/24-WP/57)**

2.3.7.1 It was reported that the requirements in Part 3;5.2.1 b) for cushioning and, for liquid dangerous goods, absorbent material to be placed in intermediate packaging under the excepted quantity provisions was cumbersome for some end users who wished to use the intermediate package as storage. An amendment to 3;5.2.1 b) was proposed which provided alternate options which did not include the requirement for the material to be placed in the intermediate packaging but which would assure that no liquid would escape the package in the event of breakage or leakage.

2.3.7.2 Although there was support for the intent of the proposal, some members felt that the wording of it was complicated and that there would be a need for many editorial changes. It was noted that the requirements were contained in the Model Regulations and that an amendment had been proposed to the UN Sub-Committee at its 43rd Session but that the proposal was not adopted at that time. The subject would be readdressed at the Sub-Committee's next session. The amendment could not be agreed at DGP/24, but interested parties would work with the proposer to clarify the provisions so that a revised amendment could be presented to the UN Sub-Committee.

2.3.8 **UN 3242 — Azodicarbonamide (DGP/24-WP/74)**

2.3.8.1 A proposal to amend Table 3-1 for UN 3242, **Azodicarbonamide** was made at DGP-WG/13 (see paragraph 3.2.18 of the DGP-WG/13 Report (DGP/24-WP/3). It was argued that an amendment was needed for the sake of alignment with the UN Model Regulations and the IMO IMDG Code to permit **Azodicarbonamide** for transport by air. A new packing instruction applied to UN 3242 was also proposed. Some members requested more time to consider the proposal, as there were some concerns that the new packing instruction needed to be further aligned with the Model Regulations.

2.3.8.2 Since that time advice had been sought from an expert group on the explosive risks of unstable substances. The feedback suggested that although these materials did not meet the technical definition of self-reactive, they did have properties that could result in an explosive effect. It was noted that in Part 2;4.2.3.2.2, three related substances specifically listed by name in Table 3-1 were listed. In the UN Model Regulations, all three were assigned to packing instruction P409 and all three were forbidden on both passenger and cargo aircraft in the Instructions. This, combined with the feedback from the expert group, suggested that it would be inappropriate to change the current forbidden/forbidden status of this substance.

2.3.8.3 It was queried whether these substances would only pose a risk at the higher quantities permitted in the Model Regulations and perhaps would not pose a risk in the smaller quantities permitted for air transport. This would need to be determined.

2.3.8.4 The meeting did not feel sufficient information was available to agree to the amendment. The proposer would work with interested parties to determine what information was needed so that the issue could be reconsidered at a future time.

2.4 AMENDMENTS TO PART 4 OF THE TECHNICAL INSTRUCTIONS: PACKING INSTRUCTIONS

2.4.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 4 (DGP/24-WP/14, Revised)

2.4.1.1 The meeting reviewed amendments to Part 4 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.**

2.4.1.2 It was suggested that the reference to adding suitable cushioning used to prevent movement within a package in new paragraph 4;1.1.10.2 was inappropriate as it was believed that the cushioning material could only be used if it was used when the packaging underwent testing. The text was adopted for the sake of alignment with the Model Regulations, but the concern would be brought to the attention of the UN Sub-Committee.

2.4.1.3 Requirements for cylinders and closures containing toxic gases contained in Packing Instruction 219 would be moved to the Supplement on the basis that toxic gases were forbidden for transport by air under normal circumstances. Requirements for cylinders containing pyrophoric gases would be moved to the Supplement for the same reason. Table 1 was deleted as only three substances listed in it were permitted for transport by air (UN 3510, UN 3511 and UN 3513) and the same special packing provision applied to all three. The packing provision would be included with the requirements of the main body of Packing Instruction 219.

2.4.1.4 Part 4;9.1.6 required confirmation that a packaging first used to transport radioactive material had been manufactured in conformity with the design specifications, but it did not specifically state who was required to confirm. An observer from the IAEA explained that it was normally understood that these responsibilities were the shipper's, but that it was up to each State to assign them. It was believed that this should be clarified in the regulations and suggested that the Secretary bring it to the attention of the IAEA Transport Safety Standards Committee (TRANSSC).

2.4.1.5 The compatibility requirement in Packing Instruction 877 related to substances being permitted in glass or earthenware inner packagings contradicted the additional packing requirement for substances being packed in a metal or plastics primary receptacle and was therefore deleted.

2.4.1.6 It was noted that referring to 2;9.3 in some packing instructions while referring more specifically to 2;9.3.1 a) and e) in Section II of Packing Instructions 965-970 was intentional as the requirements in sub-paragraphs a) and e) of 2;9.3.1 were the only that applied to the excepted batteries.

2.4.1.7 It was suggested that consequential amendments to Packing Instruction 971 were required based on the assignment of the new Table 3-1 entry for UN 3508 — **Capacitor, asymmetric** to that packing instruction. This was agreed.

2.4.2 **Life-Saving Appliances (DGP/24-WP/4)**

2.4.2.1 An amendment to the packing instruction for UN 3072 — **Life-saving appliances, not self-inflating** (Packing Instruction 955) was proposed. The proposal was in follow-up to discussions at DGP-WG/13 on cases where some manufacturers classified articles such as emergency locator transmitters, emergency position indicating radio beacons and personal locating beacons which contained only lithium batteries as UN 3072, while other manufacturers classified them as lithium batteries contained in equipment (UN 3091 or UN 3481) (see paragraph 3.2.20 of the DGP-WG/13 Report, DGP/24-WP/3). The working group agreed to assign Special Provision A182 to UN 3072 so that equipment containing only lithium batteries would be classified as UN 3091 or UN 3481.

2.4.2.2 Recognizing that Packing Instruction 955 applied to both UN 3072 and UN 2990 — **Life-saving appliances, self-inflating**, an amendment to that packing instruction to ensure that appropriate safety measures were in place when these articles contained lithium batteries was also proposed at DGP-WG/13. However, although the working group supported an amendment in principle, it could not agree to the wording proposed. A new proposal was presented to DGP/24, taking into account the discussions at DGP-WG/13. The proposal contained three general amendments to Packing Instruction 955:

a) introductory text currently positioned under additional packing requirements was moved to the beginning of the packing instruction;

b) a requirement in P905 of the UN Model Regulations for batteries in Class 8 and lithium batteries to be disconnected or electrically isolated was added to the additional packing requirements;

c) provisions related to passenger restraint systems allowing for a gas cartridge containing a Division 2.2 gas and up to two actuating cartridges were deleted on the basis that these devices should be assigned to UN 0503 — **Safety devices, pyrotechnic** or UN 3268 — **Safety devices, electrically initiated**. It was recognized that these provisions were introduced in the Technical Instructions prior to the adoption of specific UN numbers for air bags and seat belt pretensioners (renamed "safety devices" in the 18th Revised Edition of the Model Regulations and reflected in the amendments to the Technical Instructions proposed in this report). It was noted that safety devices must be packed in UN specification packagings, whereas life-saving appliances only required strong outer packagings.

2.4.2.3 There was support for the intent of the proposal, but concerns were raised with the lack of a limit for the size of the battery in cases where UN 3072 and UN 2990 contained lithium batteries and the fact that there would be no hazard communication to indicate this. One member suggested adding a requirement for the application of the lithium battery handling label, but others felt that the hazard communication problem was a wider problem that would need to be addressed more comprehensively. It was agreed that the Secretary would bring this issue to the attention of the UN Sub-Committee.

2.4.2.4 The amendment was agreed, subject to an editorial amendment to reverse the order of the first two paragraphs of the packing instruction.

2.4.3 Small Quantities of Peroxyacetic Acid (DGP/24-WP/34)

2.4.3.1 A new special provision assigned to UN 3107, **Organic peroxide type E, liquid** was presented to DGP-WG/13 which would allow for limited venting of oxygen in the case of specialized peroxyacetic acid packagings. It was reported that peroxyacetic acid was commonly used as a sterilizer for health care purposes and that there was a need to transport the material by air for use in sterilizing medical equipment using custom packagings. Exemptions to permit transport of this substance in small containers provided certain requirements were met had been issued by appropriate national authorities in four States. It was proposed that the proposed new special provision be added to the Technical Instructions to eliminate the need for these exemptions and to facilitate international transport. Although there was sympathy for the proposal, the working group had a number of concerns and could not support the amendment.

2.4.3.2 A revised proposal was presented to DGP/24 which took into account the concerns raised at DGP-WG/13. Instead of a new special provision, an amendment to include additional packaging requirements in Packing Instruction 570 (assigned to UN 3107, **Organic peroxide type E, liquid** and UN 3109, **Organic peroxide type F, liquid)**, was proposed. The meeting was presented with two approaches to amending Packing Instruction 570: one was a more generalized approach while the other reflected existing exemptions.

2.4.3.3 It was suggested that when venting was permitted, the requirements of 4;1.1.6, 4;1.1.12 and 4;7.1.2 would be impracticable and should therefore not apply. This exception was added to the revised Packing Instruction 570. The proposer noted that Special Provision A75 was amended in the 2013-2014 Edition of the Technical Instructions to permit venting and asked the panel to consider amending the provision to indicate that 4;1.1.6, 4;1.1.12 and 4;7.1.2 should not apply. This was agreed.

2.4.3.4 There was general support for the proposal presented but a few concerns were raised related to the release of oxygen limits and the fact that the proposal did not limit the provision to sterilizing devices. Whether or not the provision should apply to both passenger and cargo aircraft was discussed, but it was believed that it should be restricted to cargo aircraft. A revised proposal was agreed, subject to some editorial amendments.

2.4.4 Class 6 — Toxic And Infectious Substances Packing Instruction 620 (DGP/24-WP/35)

2.4.4.1 The panel was ask to discuss the wording of the pressure differential requirement in sub-paragraph e) of Packing Instruction 620, i.e. “the primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range –40°C to +55°C whatever the intended temperature of the consignment.” It was suggested that the relationship between the measurement of the pressure differential and the temperature range was unclear and was open to interpretation.

2.4.4.2 It was noted that this was UN text and that the question had been raised on more than one occasion by the DGP and at the UN Sub-Committee but that a single opinion on the interpretation of the text had yet to be agreed upon. The requirements were applied differently in different parts of the world which sometimes resulted in both positive and negative test results. It was hoped that one distinct interpretation could be determined, but that this would need to be done by the UN Sub-Committee.

2.4.5 **Provisions for General Packing Requirements (DGP/24-WP/36)**

2.4.5.1 It was proposed to replace an "and" with an "or" in the phrase in Part 4;1.1.2 which stated "except as provided for in 1.1.10.1 or 6;4.1.7" as it was felt that keeping "and" meant that the conditions in both paragraphs would need to be met in order for the exception to apply. While some members believed that "and" was appropriate, others agreed that it caused confusion and that "or" was more appropriate. The amendment was agreed.

2.4.5.2 During discussion it was noted that Part 4;1.1.10.1 referred to a "large packaging" which was not permitted for air transport. This would be deleted.

2.4.6 **Packing Instruction 457 (DGP/24-WP/44)**

2.4.6.1 A proposal to remove all metal packagings from the list of authorized packagings in Packing Instruction 457, which was assigned to UN 3241, **2-Bromo-2-nitropropane-1,3-diol** was supported without objection. The panel agreed that the this was necessary for the sake of alignment with the equivalent packing instruction in the Model Regulations (P520).

2.4.7 **Provisions for UN 2983 – Ethylene Oxide and Propylene Oxide Mixtures (DGP/24-WP/47)**

2.4.7.1 A paper was introduced to DGP-WG/12 identifying a discrepancy between the packaging assigned to UN 2983 (Packing Instruction 361) and the UN Model Regulations (P200) (see paragraph 3.2.18.3 of the DGP-WG/12 Report (DGP/24-WP/2)). It was suggested that Packing Instruction 361 of the Technical Instructions be amended to harmonize with P200 of the UN Model Regulations. The working group agreed to refer the question to the UN Sub-Committee to consider if the assignment of P200 authorizing the use of pressure receptacles only was appropriate (see paragraph 3.2.18.6 of the DGP-WG/12 Report (DGP/24-WP/2)).

2.4.7.2 The meeting was informed that an informal paper was presented to the 43rd session of the UN Sub-Committee (UN/SCETDG/43/INF.28). The informal paper was not considered by the Sub-committee due to time constraints. The presenter reported that a comparison of packaging provisions for other flammable liquids assigned to P001 of the Model Regulations with similar properties (i.e. flammable liquids with toxic subsidiary risks and similar vapour pressures) indicated that P001, corresponding to Packing Instruction 361 of the Technical Instructions, may be the more appropriate packing instruction.

2.4.7.3 Although the informal paper was not discussed at the 43rd session of the UN Sub-Committee, it had been added as a working paper for the 44th Session. It was believed there was no justification to change anything, but that any additional information coming forward from the UN session would be brought to the attention of the DGP for consideration.

2.4.8 **Packing Requirements for Fuel System Components (DGP/24-WP/54)**

2.4.8.1 It was suggested that the last paragraph in Packing Instruction 962 which requires dangerous goods in apparatus or machinery to be packed in strong outer packagings, unless the receptacles containing the dangerous goods are afforded adequate protection by the construction of the apparatus or machinery, would be more appropriately placed under "Additional packing requirements".

An amendment to move the paragraph was therefore proposed. It was also proposed to delete the "Outer packagings of combination packagings" heading on the basis that the packing instruction applied to articles that did not require inner packaging.

2.4.8.2 The amendment was agreed.

2.4.9 **Packing Instructions 950, 951 and 952 (DGP/24-WP/70)**

2.4.9.1 It was suggested that the wording of the requirement in Packing Instructions 950, 951 and 952 for dangerous goods required for the operation of a vehicle (such as fire extinguishers, tire inflation canisters or safety devices) was inappropriate as the items listed were not required for the operation of a vehicle. A minor amendment to address this was proposed. A revised amendment, which specified that the dangerous goods needed to be required for the operation or "safety" of the vehicle, was agreed.

2.4.10 **Packing Instruction 203: UN 1950 and UN 2037 (DGP/24-WP/80)**

2.4.10.1 It was noted that Packing Instruction 203 applied to both UN 2037 (**Gas cartridges** and **Receptacles, small, containing gas)** and UN 1950 (**Aerosols**). The packing instruction made it clear that UN tested outer packaging was required for UN 1950, but its structure made it unclear if the same was true for UN 2037. A study of the applicable packing instructions of the UN Model Regulations suggested that UN tested outer packaging was required for both. The panel agreed to this interpretation; a list of UN specification outer packagings permitted was therefore added to the packing instruction to make it clear that UN tested packing was required for both.

2.4.10.2 The study also revealed that boxes and drums were permitted for UN 2037 in the Model Regulations, but the Technical Instructions only permitted boxes. It was proposed that there was no justification not to include not only drums but also jerricans in addition to boxes. The panel agreed to the addition of drums but decided against the addition of jerricans since these were not included in the applicable UN packing instruction.

2.4.10.3 It was suggested that use of the term "receptacle" in Packing Instruction 203 could cause confusion as it could apply solely to **Receptacles, small, containing gas (**UN 2037) or, if the definition in Part 1;3 was taken into account, to **Aerosols** as well. The panel agreed to the addition of a note clarifying that any reference to receptacle in the packing instruction included both "aerosols" and "receptacles, small, containing gas". The applicable changes would also be made to the limited quantity packing instruction (Packing Instruction Y203).

2.5 AMENDMENTS TO PART 5 OF THE TECHNICAL INSTRUCTIONS: SHIPPER'S RESPONSIBILITIES

2.5.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 5 (DGP/24-WP/15)

2.5.1.1 The meeting reviewed amendments to Part 5 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13.

2.5.1.2 The panel believed that the new requirements in Part 5;4.1.5.7.1 for paragraph references to appear on the transport document were impractical as the paragraph number would be different depending on the mode. The requirements were maintained for the sake of harmonization, but the issue would be raised at the UN Sub-Committee.

2.5.1.3 A new footnote in the declaration text on the transport document was not adopted as it was felt to be unnecessary. The UN Sub-Committee would be informed.

2.5.2 Clarification on the Application of Labels (DGP/24-WP/56)

2.5.2.1 A paper was presented to DGP-WG/13 that proposed a slight amendment to Part 5;3.2.8 to clarify that the provisions of 5;3.2.8 applied to the application of hazard labels and not to handling labels (see paragraph 3.2.32 of the DGP-WG/13 Report (DGP/24-WP/3)). There was initial support for the proposal until it was realized that some of the provisions of 5;3.2.8 also applied to handling labels. A revised amendment which modified both 5;3.2.8 to address hazard labels and 5;3.2.12 to address handling labels was proposed. The amendment was agreed, subject to editorial revisions.

2.5.2.2 During the discussion, it was noted that different terms were used to address hazard labels throughout the Instructions. It was agreed that a standard term should be applied and that this would be addressed during the next biennium.

2.6 AMENDMENTS TO PART 6 OF THE TECHNICAL INSTRUCTIONS: PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS

2.6.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 6 (DGP/24-WP/16, Revised)

2.6.1.1 The meeting reviewed amendments to Part 6 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.**

2.6.1.2 Provisions for applications and approvals for radioactive material appeared in the UN Model Regulations but not the Technical Instructions. The provisions were intended for approvals from competent authorities and did not address any specific requirements for aviation. The meeting considered

adopting them in the Instructions, but it was determined that a reference to the provisions in the Model Regulations would be adequate.

2.6.1.3 New provisions for packages excepted from the requirements for fissile materials and a transitional period for consignments prepared before December 2014 were not adopted on the basis that these were only permitted for transport under exclusive use and would likely never be transported by air.

2.6.2 Provisions for Packagings for Infectious Substances of Category A (DGP/24-WP/37)

2.6.2.1 It was suggested that a contradiction existed between Part 6;6.5.2.2.1.1 which refers to a single sample being dropped five times and Part 6;6.5.3.6.3 which refers to one sample being dropped. An amendment was proposed to remove this contradiction.

2.6.2.2 Although the panel agreed that the provisions were difficult to read, it did not believe that there was a contradiction and that an amendment was therefore unnecessary. Part 6;6.5.2.2.1 set out the testing requirements for any packaging consisting of a fibreboard outer box with a plastics primary receptacle whereby five samples must undergo a water spray test prior to dropping and another five samples must be conditioned to -18°C prior to dropping. If the packaging was to contain dry ice, then one additional sample must be stored so that all the dry ice dissipates as described in 6;6.5.3.6.3 and that one sample must be dropped five times in the orientation which would most likely result in the failure of the packaging.

2.6.2.3 There was a suggestion that guidance be provided in the form of a note, but this was not supported on the basis that these were UN requirements. It was believed that the explanation provided above (paragraph 2.6.2.2) would suffice.

2.6.3 Internal Pressure for Packages of Radioactive Material Transported By Air (DGP/24-WP/42)

2.6.3.1 The meeting was advised of an amendment proposed to IAEA SSR-6 related to the pressure differential a package must be capable of withstanding without loss or dispersal of radioactive contents from the containment system of the package (paragraph 621 of IAEA SSR-6). The equivalent requirement in the Technical Instructions was contained in Part 6;7.2.3. The IAEA recommended that the opinion of the DGP be sought before the next IAEA TRANSSC meeting (TRANSSC 27, November 2013).

2.6.3.2 It was suggested to the meeting that the requirement in SSR-6, paragraph 621 (Part 6;7.2.3 of the Instructions) did not take into account the form of the radioactive material and the degree of risk a release of this radioactive material from the containment system of a package would incur on aircraft security and on passenger and crew safety. Accordingly, the amendment proposed broke the requirement into three different categories based on the physical form and degree of risk with different conditions applied to each.

2.6.3.3 While some panel members understood the logic in developing different requirements based on the level of risk in that this approach was applied to other dangerous goods, they believed that breaking the requirements into three different categories would complicate the provisions and make them more difficult to understand. They did not feel there was sufficient justification for lowering the standards and that the current provisions should remain.

2.7 AMENDMENTS TO PART 7 OF THE TECHNICAL INSTRUCTIONS: OPERATOR'S RESPONSIBILITIES

2.7.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Part 7 (DGP/24-WP/17)

2.7.1.1 The meeting reviewed amendments to Part 7 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.** The amendments were agreed.

2.7.2 Online Ticket Purchase and Check-in — Provision of Information (DGP/24-WP/26)

2.7.2.1 This working paper was withdrawn.

2.7.3 Provision of Information to Passengers (DGP/24-WP/31)

2.7.3.1 It was suggested that text which had existed in Part 7;5.1 prior to the 2011-2012 Edition of the Technical Instructions had been inadvertently removed and should be reinstated. Part 7;5.1 was amended in the 2011-2012 Edition to address the increasing use of the internet for flight bookings and check-in, the use of telephones and kiosks at airports for check-in. It was suggested, however, that the new text did not address cases when a passenger might make a booking over the telephone with the operator providing the dangerous goods information with a booking confirmation by post or email. Amended text to reinstate this requirement was agreed.

2.7.3.2 A further amendment to replace references to "provided" with "presented" in Part 7;5.1 was proposed to make it clear that passengers had to see information on the types of dangerous goods forbidden to be transported before proceeding with check-in. It was reported that some operators published the required information in areas on a website that were not always visible to the passenger, believing that this met the requirement of being "provided". Although there was concern with the revised text having the same meaning in languages other than English, the majority supported the amendment and it was agreed.

2.7.4 Visibility of ULD Tag (DGP/24-WP/51)

2.7.4.1 A new note under Part 7;2.8.4 was proposed at DGP-WG/13 to emphasize that unit load device (ULD) identification tags should be clearly visible through protective pouch windows. There was much support for the intent of that proposal, with many members stating that this was a common problem. However, many felt that the provision should be a requirement instead of a recommendation and that a more comprehensive review of paragraph 7;2.8 was needed before agreeing to any text.

2.7.4.2 A new proposal was presented to DGP/24. All of the revisions to the proposed amendment suggested at DGP-WG/13 were taken into account in developing the new amendment, except for one related to adding text to indicate that the red hatchings on the tag must also be visible. It was believed that this was not necessary as red hatchings were part of the identification tag and it should be understood that they must also be visible.

2.7.4.3 There was support for the proposal but some concerns were raised. The importance of emphasizing that the information on the tag needed to be visible and legible, not just the tag itself, was raised. The fact that an identification tag applied to a pallet could flutter and could result in the information not being visible would also need to be taken into account. A revised amendment was agreed.

2.7.5 Provisions to Aid Recognition of Undeclared Dangerous Goods (DGP/24-WP/53)

2.7.5.1 A proposal to add new and amended provisions to aid recognition of undeclared dangerous goods was agreed. One panel member suggested that work continue on improving the provisions during the next biennium. This was also agreed.

2.7.6 Dangerous Goods Occurrences and Discrepancies (DGP/24-WP/60) and Definition of Dangerous Goods Occurrence and Discrepancy (DGP/24-WP/68)

2.7.6.1 A proposal to establish a general title for all reporting types was presented. The title would be "Occurrence Reporting" and it would encompass dangerous goods accidents, incidents, undeclared and misdeclared dangerous goods and "discrepancies". Dangerous goods discrepancies would include any occurrence of non-compliance other than dangerous goods accidents or incidents. Definitions for occurrence and discrepancy were included with the proposal. Also included was a new recommendation for operators to establish an internal reporting system for dangerous goods discrepancies in the form of a note under 7;4. It was suggested that discrepancies could become severe unless measures were taken to prevent their recurrence and that reporting could be beneficial.

2.7.6.2 The panel expressed its gratitude for the work done on analyzing the reporting requirements in the Technical Instructions. However, many were uncomfortable with adding a recommendation for reporting any type of non-compliance as this would result in reports of items rejected during an acceptance which would be unnecessary information for regulators. It was understood that there was nothing to stop a State from requiring more in terms of reporting, but the panel did not see benefit in adding anything new to the Instructions. The complexity of the reporting requirements was recognized, and it was suggested that guidance material should be developed for incorporation in the Supplement during the next biennium. It was believed that this guidance material would also facilitate data collection for the dangerous goods accident and incident reporting system (see paragraph 5.2 of the Report on Agenda Item 5).

2.7.7 Application of the ULD Tag for Magnetized Material (DGP/24-WP/71)

2.7.7.1 A revision to Part 7;1.4.2 to remove the requirement for the operator to attach an identification tag to ULDs containing magnetized material was proposed on the basis that the requirement only applied when the package of dangerous goods required a hazard label, and magnetized material did not require hazard labels. The amendment was agreed.

2.7.8 Introduction of the UN Globally Harmonized System for Marking and Labelling of Chemicals (GHS) (DGP/24-WP/72)

2.7.8.1 New text referring to diamond-shaped pictograms adopted by the UN Globally Harmonized System for Marking and Labelling Chemicals (GHS) was proposed for inclusion in Part 7;6. It was reported that while some pictograms were clearly indicators of a substance which posed a hazard for supply and use, others were similar to dangerous goods hazard labels and the presence of these diamond-shaped pictograms caused operators to question whether the package had not been properly declared as dangerous goods. It was believed that the proposed text would help make operators aware of the pictograms allowing them to take appropriate action. The panel was also invited to consider whether guidance material on the relationship between the GHS and dangerous goods should be developed for inclusion in the Supplement to the Technical Instructions.

2.7.8.2 While there was sympathy for the proposal, a number of panel members believed that a note or guidance material with real examples would be more beneficial. Some were also concerned that a recommendation in the proposed text for acceptance staff to seek confirmation from the shipper would cause undue delays in shipment. A revised proposal which eliminated this recommendation and converted the proposed text into a note was agreed. A link to GHS guidance material on the United Nations Economic Commission for Europe (UNECE) website was added to the note.

2.8 AMENDMENTS TO PART 8 OF THE TECHNICAL INSTRUCTIONS: PROVISIONS CONCERNING PASSENGERS AND CREW

2.8.1 Draft Amendments to the Technical Instructions — Part 8 (DGP/24-WP/18)

2.8.1.1 The meeting reviewed amendments to Part 8 of the Technical Instructions to reflect proposals agreed by DGP-WG/12 and DGP-WG/13**.** These were agreed.

2.8.2 Use of the Term Cartridge and Cylinder in Table 8-1 (DGP/24-WP/49)

2.8.2.1 It was noted that there were two entries in Item 18) of Table 8-1 relating to small cartridges. Although the term “cartridges” was used in the first column of Table 8-1 (Items or articles), “cylinder” was used in the last column (Restrictions). In examining the definition for “cylinders” in Part 1;3 of the Instructions and the definition for cartridges from a standard dictionary (this term is not defined in the Instructions), it was believed that “cartridge” was the more appropriate term. An amendment to replace “cylinder” with “cartridges” was agreed.

2.8.3 Provisions for Dangerous Goods Carried by Passengers or Crew (DGP/24-WP/50)

2.8.3.1 An editorial amendment to Part 8;1.1.2 to correct an anomaly introduced when the provisions were reformatted into a table was agreed. Additional references to Part 8 discovered not to have been updated following the reformatting of the passenger and crew provisions into a tabular format would also be corrected.

2.8.4 **Portable Electronic Devices (DGP/24-WP/52)**

2.8.4.1 It was suggested that the provision in Table 8-1 for portable electronic devices (Item 19) excluded devices powered by lithium batteries such as power tools, remote controlled toys and e-cigarettes that were not usually found in electronics departments. It was therefore not clear if these devices could be carried under the provision in Item 19). It was believed that as long as the criteria in Item 19 were met, any lithium battery powered device should be permitted. An amendment to replace "portable electronic devices" with "portable lithium battery-powered devices" was therefore proposed.

2.8.4.2 While some believed this was a useful clarification, others believed that the abbreviation for personal electronic devices (PEDs) was a widely-accepted abbreviation that had been incorporated in passenger information and should not change. Members were also against specifying lithium batteries in the header row of Item 19 as this would exclude devices powered by other types of batteries.

2.8.4.3 The panel agreed that any device containing lithium batteries could be carried under the provision in Item 19) as long as the conditions listed in the restrictions column of Table 8-1 were met. This included but was not limited to power tools, remote controlled toys and e-cigarettes. Including these as examples in Table 8-1 was not agreed on the basis that it would be impossible to provide an exhaustive list.

2.8.5 **Pacemakers (DGP/24-WP/62)**

2.8.5.1 It was noted that some cardiac pacemakers were externally fitted on a patient but that the provision in Part 8 of the Technical Instruction referred to pacemakers implanted into a person. An amendment to allow for externally fitted pacemakers was proposed at DGP-WG/12 to address this, but it was felt that the revision would extend the provision to equipment other than cardiac pacemakers.

2.8.5.2 A slight modification to the amendment presented at DGP-WG/12 was proposed. This would restrict the extension of the provision to cardiac pacemakers and other medical devices. The revised amendment was agreed.

2.8.6 **Review of Provisions for Battery-Powered Mobility Aids (DGP/24-WP/79)**

2.8.6.1 The meeting considered whether there was justification to review, during the next biennium, provisions for mobility aids in conjunction with associations for persons with reduced mobility and/or organizations representing the manufacturers of battery-powered mobility aids. Items to consider would include:

a) Establishment of a watt-hour rating limit (or recommended maximum limit) for lithium ion batteries in mobility aids. Whether or not this would be a "hard" limit or if provision for the limit to be exceeded where there was a demonstrated need for additional power would be considered for purposes such as powering a ventilator, perhaps with appropriate approvals.

b) Consideration of provisions for the carriage of spare batteries for mobility aids. Whether or not there was a real need for persons with reduced mobility to be able to carry a spare battery as part of their baggage when travelling or whether this were a "niche" requirement would need to be identified.

c) Clearly defining what constitutes "collapsible". It was reported that operators were currently being faced with a number of different designs of mobility aids, some of which could be "collapsed" for transport.

d) Considering whether a "code of conduct" for mobility aid manufacturers should be established, where the manufacturer would clearly identify how the mobility aid was made safe for air transport and even potentially have standard methods to "disable" the mobility aid when being transported. It was believed that this would greatly simplify the operator's acceptance of the mobility aid.

2.8.6.2 There was strong support for the establishment of a working group through correspondence to address these issues during the next biennium.

2.9 AMENDMENTS TO ATTACHMENT 2 OF THE TECHNICAL INSTRUCTIONS: GLOSSARY OF TERMS

2.9.1 Draft Amendments to the Technical Instructions to Align with the UN Recommendations — Attachment 2 (DGP/24-WP/19)

2.9.1.1 The meeting reviewed amendments to Attachment 2 of the Technical Instructions to reflect the decisions taken by the UNCOE at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.**

2.10 RECOMMENDATION

2.10.1 In light of the foregoing discussions, the meeting developed the following recommendation:

Recommendation 2/1 — Amendment to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284)

That the Technical Instructions be amended as indicated in the appendix to the report on this agenda item.

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APPENDIX

PROPOSED AMENDMENTS TO THE TECHNICAL INSTRUCTIONS

Part 1

GENERAL

. . .

Chapter 1

SCOPE AND APPLICABILITY

. . .

UN Model Regulations, 18th revised Edition

Note.— Recommendations on Tests and Criteria, which are incorporated by reference into certain provisions of these Instructions, are published as a separate Manual (United Nations Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria) (ST/SG/AC.10/11/Rev.5 ~~and~~, Amend.1 and Amend.2), the contents of which are:

. . .

DGP/24-WP/67 (paragraph 2.1.3)

1.1.5.1 Except for 7;4.2, these Instructions do not apply to dangerous goods carried by an aircraft where the dangerous goods are:

. . .

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

. . .

Chapter 2

LIMITATION OF DANGEROUS GOODS ON AIRCRAFT

. . .

2.3 TRANSPORT OF DANGEROUS GOODS BY POST

. . .

DGP/24-WP/24 and paragraph 2.2.3 of this report

2.3.2 The following dangerous goods may be acceptable in mail for air carriage subject to the provisions of the appropriate national authorities concerned and these Instructions which relate to such material:

a) patient specimens as defined in 2;6.3.1.4 provided that they are classified, packed and marked as required by 2;6.3.2.3.6 a), b) c) and d);

b) infectious substances assigned to category B (UN 3373) only, when packed in accordance with the requirements of Packing Instruction 650, and solid carbon dioxide (dry ice) when used as a refrigerant for UN 3373; and

UN Model Regulations, paragraph 1.1.1.6, ST/SG/AC.10/40/Add.1.
1;2.3.2 c) was modified after DGP-WG/13 (see DGP/24-WP/3, Paragraph 3.2.1 a)) based on a review of IAEA Safety Standards Series No. SSR-6 and Universal Postal Union (UPU) requirements. Reference to 1;6.1.5 was replaced with a reference to "UN Nos. 2910 and 2911 only" and a new second sentence was added.

c) radioactive material in an excepted package, UN Nos. 2910 and 2911 only, the activity of which does not exceed one-tenth of that listed in Part 2, Chapter 7, Table ~~2-15~~2-14, and that does not meet the definitions and criteria of classes, other than Class 7, or divisions, as defined in Part 2. The package must be marked with the name of the shipper and the consignee, the package must be marked "radioactive material — quantities permitted for movement by post" and must bear the radioactive material, excepted package label (Figure 5-31);

. . .

UN Model Regulations, new paragraph 1.1.1.9, ST/SG/AC.10/40/Add.1 and
ST/SG/AC.10/C.3/86/Add.1
DGP/24-WP/3 (paragraph 3.2.1.1 b)), DGP/24-WP/43 and paragraphs 2.1.1.1 and 2.1.2 of this report

2.6 LAMPS CONTAINING DANGEROUS GOODS

The following lamps are not subject to these Instructions provided that they do not contain radioactive material:

a) lamps each containing not more than 1 g of dangerous goods and packaged so that there is not more than 30 g of dangerous goods per package, provided that:

1) the lamps are certified to a manufacturer's quality management system; and

Note.— The application of ISO 9001:2008 may be considered acceptable for this purpose.

2) each lamp is either individually packed in inner packagings, separated by dividers, or surrounded with cushioning material to protect the lamps and packed into strong outer packagings meeting the general provisions of 4;1.1 and capable of passing a 1.2 m drop test; and

b) lamps containing only gases of Division 2.2 (according to 2;2.2.1) provided they are packaged so that the projectile effects of any rupture of the bulb will be contained within the package.

Note.— Lamps containing radioactive material are addressed in 2;7.2.2.2 b).

Chapter 3

GENERAL INFORMATION

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

3.1 DEFINITIONS

. . .

UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1) and paragraph 2.1.1.1 of this report

Approval. For the transport of ~~Class 7~~ radioactive material:

Multilateral approval. The approval by the relevant competent authority of the country of origin of the design or shipment, as applicable, and also, where the consignment is to be transported through or into any other country, approval by the competent authority of that country.

Unilateral approval. The approval of a design which is required to be given by the competent authority of the country of origin of the design only.

. . .

DGP/24-WP/3 (paragraph 3.2.7) and paragraph 2.1.1.1 of this report

Bundles of cylinders. ~~(See UN Recommendations, Chapter 1.2).~~ Not permitted for air transport. An assembly of cylinders that are fastened together and which are interconnected by a manifold and transported as a unit.

. . .

UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1) and paragraph 2.1.1.1 of this report

Confinement system. For the transport of ~~Class 7~~ radioactive material, the assembly of fissile material and packaging components specified by the designer and agreed to by the competent authority as intended to preserve criticality safety.

. . .

Containment system. For the transport of ~~Class 7~~ radioactive material, the assembly of components of the packaging specified by the designer as intended to retain the radioactive material during transport.

. . .

Criticality safety index (CSI) assigned to a package, overpack or freight container containing fissile material. For the transport of ~~Class 7~~ radioactive material, a number which is used to provide control over the accumulation of packages, overpacks or freight containers containing fissile material.

. . .

Design. For the transport of ~~Class 7~~ radioactive material, the description of fissile material excepted under 2;7.2.3.5.1 f), special form radioactive material, low dispersible radioactive material, package or packaging which enables such items to be fully identified. The description may include specifications, engineering drawings, reports demonstrating compliance with regulatory requirements, and other relevant documentation.

. . .

Exclusive use. For the transport of ~~Class 7~~ radioactive material, the sole use, by a single shipper, of an aircraft or of a large freight container, in respect of which all initial, intermediate and final loading and unloading and shipment ~~is~~ are carried out in accordance with the directions of the shipper or consignee, where so required by these Instructions.

. . .

The definition for *freight container in the case of radioactive material transport* is repeated in 2;7.1.3. It is proposed to replace the definition in this part with a cross reference to 2;7.1.3 as indicated below.

Freight container in the case of radioactive material transport. ~~An article of transport equipment designed to facilitate the transport of packaged goods by one or more modes of transport without intermediate reloading, which is of a permanent enclosed character, rigid and strong enough for repeated use, and must be fitted with devices facilitating its handling, particularly in transfer between aircraft and from one mode of transport to another. A small freight container is that which has either an overall outer dimension less than 1.5 m, or an internal volume of not more than 3 m^3. Any other freight container is considered to be a large freight container. For the transport of Class 7 material, a freight container may be used as a packaging.~~ See 2;7.1.3.

. . .

UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1.1 d)) and paragraph 2.1.1.2 of this report

Large salvage packaging. ~~(See UN Recommendations, Chapter 1.2).~~ (Not permitted for air transport.) A special packaging which:

a) is designed for mechanical handling; and

b) exceeds 400 kg net mass or 450 litres capacity but has a volume of not more than 3 m^3;

into which damaged, defective or leaking dangerous goods packages, or dangerous goods that have spilled or leaked are placed for purposes of transport for recovery or disposal.

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Manual of Tests and Criteria. The fifth revised edition of the United Nations publication entitled Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria (ST/SG/AC.10/11/ Rev.5 ~~and~~ Amend.1 and Amend.2).

UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1) and paragraph 2.1.1.1 of this report

Management system, for the transport of radioactive material. A set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner.

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Maximum normal operating pressure. For the transport of ~~Class 7~~ radioactive material, the maximum pressure above atmospheric pressure at mean sea level that would develop in the containment system in a period of one year under the conditions of temperature and solar radiation corresponding to environmental conditions in the absence of venting, external cooling by an ancillary system, or operational controls during transport.

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DGP/24-WP/2 (paragraph 3.2.6) and paragraph 2.1.1.1 of this report

Net quantity. Either:

a) ~~T~~the mass or volume of the dangerous goods contained in a package excluding the mass or volume of any packaging material~~.~~; or

b) the mass of an unpackaged article of dangerous goods (e.g. UN 3166).

For the purposes of this definition, “dangerous goods” means the substance or article as described by the proper shipping name shown in Table 3-1, e.g. for “Fire extinguishers”, the net quantity is the mass of the fire extinguisher. For articles packed with equipment or contained in equipment, the net quantity is the net mass of the article, e.g. for lithium ion batteries contained in equipment, the net quantity is the net mass of the lithium ion batteries in the package.

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UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1) and paragraph 2.1.1.1 of this report

Neutron radiation detector. A device that detects neutron radiation. In such a device, a gas may be contained in a hermetically sealed electron tube transducer that converts neutron radiation into a measureable electric signal.

Radiation detection system. An apparatus that contains radiation detectors as components.

Radiation level. For the transport of ~~Class 7~~ radioactive material, the corresponding dose rate expressed in millisieverts per hour or microsieverts per hour.

Radioactive contents. For the transport of ~~Class 7~~ radioactive material, the radioactive material together with any contaminated or activated solids, liquids, and gases within the packaging.

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DGP/24-WP/3 (paragraph 3.2.6) and paragraph 2.1.1.1 of this report

Stores (supplies). a) Stores (supplies) for consumption; and b) Stores (supplies) to be taken away.

Stores (supplies) for consumption. Goods, whether or not sold, intended for consumption by the passengers and the crew on board aircraft, and goods necessary for the operation and maintenance of aircraft, including fuel and lubricants.

Stores (supplies) to be taken away. Goods for sale to the passengers and the crew of aircraft with a view to being landed.

Items that meet the classification as dangerous goods and which are transported in accordance with Part 1;2.2.2 ~~or~~, Part 1;2.2.3 or Part 1;2.2.4 are considered as "cargo".

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UN Model Regulations, Chapter 1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1) and paragraph 2.1.1.1 of this report

Transport index (TI) assigned to a package, overpack or freight container. For the transport of ~~Class 7~~ radioactive material, a number which is used to provide control over radiation exposure.

Through or into. For the transport of ~~Class 7~~ radioactive material, through or into the countries in which a consignment is transported but specifically excluding countries "over" which a consignment is carried by air, provided that there are no scheduled stops in those countries.

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Chapter 4

TRAINING

Parts of this Chapter are affected by State Variations AE 2, BR 7, CA 18, HK 1; see Table A-1

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DGP/24-WP/3 (paragraph 3.2.6) and paragraph 2.1.1.1 of this report

4.1.1 Initial and recurrent dangerous goods training programmes must be established and maintained by or on behalf of:

a) shippers of dangerous goods, including packers and persons or organizations undertaking the responsibilities of the shipper;

b) operators;

c) ground handling agencies which perform, on behalf of the operator, the act of accepting, handling, loading, unloading, transferring or other processing of cargo~~,~~ or mail ~~or stores~~;

d) ground handling agencies located at an airport which perform, on behalf of the operator, the act of processing passengers;

e) agencies, not located at an airport, which perform, on behalf of the operator, the act of checking in passengers;

f) freight forwarders;

g) agencies engaged in the security screening of passengers and crew and their baggage and/or cargo~~,~~ or mail ~~or stores~~; and

h) designated postal operators.

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4.2 TRAINING CURRICULA

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DGP/24-WP/2 (paragraphs 3.2.2 and 3.2.4) and paragraph 2.1.1.1 of this report

Table 1-4. Content of training courses

Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum	*Shippers and packers*		*Freight forwarders*			*Operators and ground handling agents*						Security staff
	Categories of staff											
	1	2	3	4	5	6	7	8	9	10	11	12
General philosophy	x	x	x	x	x	x	x	x	x	x	x	x
Limitations	x		x	x	x	x	x	x	x	x	x	x
General requirements for shippers	x		x			x						
Classification	x	x	x			x						x
List of dangerous goods	x	x	x			x				x		
Packing requirements	x	x	x			x						
Labelling and marking	x	x	x	x	x	x	x	x	x	x	x	x
Dangerous goods transport document and other relevant documentation	x		x	x		x	x					
Acceptance procedures						x						
Recognition of undeclared dangerous goods	x	x	x	x	x	x	x	x	x	x	x	x
Storage and loading procedures					x	x		x		x		
Pilots' notification						x		x		x		
Provisions for passengers and crew	x	x	x	x	x	x	x	x	x	x	x	x
Emergency procedures	x	x	x	x	x	x	x	x	x	x	x	x

~~KEY~~CATEGORY

1 — Shippers and persons undertaking the responsibilities of shippers
2 — Packers
3 — Staff of freight forwarders involved in processing dangerous goods
4 — Staff of freight forwarders involved in processing cargo or mail (other than dangerous goods)
5 — Staff of freight forwarders involved in the handling, storage and loading of cargo or mail
6 — Operator's and ground handling agent's staff accepting dangerous goods
7 — Operator's and ground handling agent's staff accepting cargo or mail (other than dangerous goods)
8 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo or mail and baggage
9 — Passenger handling staff

DGP/24-WP/3 (paragraph 3.2.3) and paragraph 2.1.1.1 of this report

10 — Flight crew members, loadmasters ~~and~~, load planners and flight operations officer/flight dispatcher
11 — Crew members (other than flight crew members)

DGP/24-WP/3 (paragraph 3.2.6) and paragraph 2.1.1.1 of this report

12 — Security staff who are involved with the screening of passengers and crew and their baggage and cargo or mail, e.g. security screeners, their supervisors and staff involved in implementing security procedures

DGP/24-WP/2 (paragraphs 3.2.2 and 3.2.4) and paragraph 2.1.1.1 of this report

Table 1-5. Content of training courses for operators not carrying dangerous goods as cargo or mail

	Categories of staff				
Contents	~~7~~13	~~8~~14	~~9~~15	~~10~~16	~~11~~17
General philosophy	X	X	X	X	X
Limitations	X	X	X	X	X
Labelling and marking	X	X	X	X	X
Dangerous goods transport document and other relevant documentation	X				
Recognition of undeclared dangerous goods	X	X	X	X	X
Provisions for passengers and crew	X	X	X	X	X
Emergency procedures	X	X	X	X	X

~~KEY~~CATEGORY

~~7~~ 13— Operator's and ground handling agent's staff accepting cargo or mail (other than dangerous goods)
~~8~~ 14 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo or mail (other than dangerous goods) and baggage
~~9~~ 15— Passenger handling staff

DGP/24-WP/3 (paragraph 3.2.3) and paragraph 2.1.1.1 of this report

~~10~~16 —Flight crew members, loadmasters ~~and~~, load planners and flight operations officer/flight dispatcher
~~11~~ 17—Crew members (other than flight crew members)

Note 1.— Depending on the responsibilities of the person, the aspects of training to be covered may vary from those shown in Tables 1-4 and 1-5. For example, in respect of classification, staff involved in implementing security procedures (e.g. screeners and their supervisors) need only be trained in the general properties of dangerous goods.

Note 2.— The categories of personnel identified in Tables 1-4 and 1-5 are not all encompassing. Personnel employed by or interacting with the aviation industry in areas such as passenger and cargo reservation centres, and engineering and maintenance, except when acting in a capacity identified in Table 1-4 or 1-5, should be provided with dangerous goods training in accordance with 4.2.

4.2.8 Staff of designated postal operators must be trained commensurate with their responsibilities. The subject matter to which their various categories of staff should be familiar with is indicated in Table 1-6.

DGP/24-WP/2 (paragraphs 3.2.2 and 3.2.4) and paragraph 2.1.1.1 of this report

Table 1-6. Content of training courses for staff of designated postal operators

Aspects of transport of dangerous goods by air with which they should be familiar, as a minimum	*Designated postal operators*		
	Categories of staff		
	A	B	C
General philosophy	x	x	x
Limitations	x	x	x
General requirements for shippers	x		
Classification	x		
List of dangerous goods	x		
Packing requirements	x		
Labelling and marking	x	x	x
Dangerous goods transport document and other relevant documentation	x	x	
Acceptance of the dangerous goods listed in 1;2.3.2	x		
Recognition of undeclared dangerous goods	x	x	x
Storage and loading procedures			x
Provisions for passengers and crew	x	x	x
Emergency procedures	x	x	x

~~KEY~~CATEGORY

A — Staff of designated postal operators involved in accepting mail containing dangerous goods
B — Staff of designated postal operators involved in processing mail (other than dangerous goods)
C — Staff of designated postal operators involved in the handling, storage and loading of mail

Note.— Guidance on the aspects of training to be covered by staff of designated postal operators can be found in S-1;3.

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UN Model Regulations, Chapter 1.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1) and paragraph 2.1.1.1 of this report

Chapter 6

GENERAL PROVISIONS CONCERNING ~~CLASS 7~~ RADIOACTIVE MATERIAL

6.1 SCOPE AND APPLICATION

6.1.1 These Instructions establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material. These Instructions are based on the IAEA *Regulations for the Safe Transport of Radioactive Material*, (20~~09~~12 Edition), IAEA Safety Standards Series No. ~~T~~SSR~~ R-1~~6, IAEA, Vienna (20~~09~~12). Explanatory material can be found in *Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material* ~~(2005 Edition)~~, IAEA Safety Standard Series No. TS-G-1.1 (Rev. ~~1~~2), IAEA, Vienna (20~~08~~12). The prime responsibility for safety must rest with the person or organization responsible for facilities and activities that give rise to radiation risk.

6.1.2 The objective of these Instructions is to establish requirements that must be satisfied to ensure safety and to protect persons, property and the environment from the effects of radiation in the transport of radioactive material. This protection is achieved by requiring:

a) containment of the radioactive contents;

b) control of external radiation levels;

c) prevention of criticality; and

d) prevention of damage caused by heat.

These requirements are satisfied firstly by applying a graded approach to the limits of the contents for packages and aircraft and to the performance standards, which are applied to package designs depending upon the hazard of the radioactive contents. Secondly, they are satisfied by imposing ~~requirements~~ conditions on the design and operation of packages and on the maintenance of the packagings, including consideration of the nature of the radioactive contents. Finally, they are satisfied by requiring administrative controls including, where appropriate, approval by competent authorities.

6.1.3 These Instructions apply to the transport of radioactive material by air, including transport that is incidental to the use of the radioactive material. Transport comprises all operations and conditions associated with and involved in the movement of radioactive material; these include the design, manufacture, maintenance and repair of packaging, and the preparation, consigning, loading, carriage including in-transit storage, unloading and receipt at the final destination of the radioactive material and packages. A graded approach is applied to the performance standards in these Instructions that are characterized by three general severity levels:

a) routine conditions of transport (incident free);

b) normal conditions of transport (minor mishaps); and

c) accident conditions of transport.

6.1.4 These Instructions do not apply to any of the following:

a) radioactive material implanted or incorporated into a person or live animal for diagnosis or treatment;

b) radioactive material in or on a person who is to be transported for medical treatment because the person has been subject to accidental or deliberate intake of or contamination from radioactive material ~~and is to be transported for medical treatment~~, taking into account the necessary radiological protection measures with respect to other passengers and crew, subject to approval by the operator;

≠ *Note.— Guidance material may be found on* www.icao.int/safety/DangerousGoods/Pages/Guidance-Material.aspx.

c) radioactive material in consumer products which have received regulatory approval, following their sale to the end user;

d) natural material and ores containing naturally occurring radionuclides (which may have been processed) ~~which are either in their natural state or have only been processed for purposes other than for extraction of the radionuclides, and are not intended to be processed for use of these radionuclides~~, provided the activity concentration of the material does not exceed 10 times the values specified in ~~2;7.2.2.1 b)~~ Table 2-12 or calculated in accordance with 2;7.2.2.2 a) and 2;7.2.2.3 to 7.2.2.6~~;~~. For natural materials and ores containing naturally occurring radionuclides that are not in secular equilibrium, the calculation of the activity concentration must be performed in accordance with 2;7.2.2.4;

e) non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit specified in the definition of contamination in 2;7.1.

6.1.5 Specific provisions for the transport of excepted packages

6.1.5.1 Excepted packages which may contain radioactive material ~~in limited quantities, instruments, manufactured articles and empty packages~~ as specified in 2;7.2.4.1.1 are subject only to the following provisions of Parts 5 to 7:

UN Model Regulations, Chapter 1.5, ST/SG/AC.10/40/Add.1 and ST/SG/AC.10/C.3/86/Add.1, Annex III
DGP/24-WP/3 (paragraph 3.2.1.1 c)) and paragraph 2.1.1.1 of this report

~~a) the applicable provisions specified in 5;1.1 i), 5;1.2.4, 5;1.4, 5;1.6.3, 5;1.7, 5;2.2, 5;2.3, 5;2.4.2, 5;3.2 .12 e), 5;3.3, 5;3.4, 5;4.4, 7;2.5, 7;3.2.2 and 7;4.4;~~

a) the applicable provisions specified in 5;1.1 (as applicable), 5;1.2.2.2, 5;1.2.4, 5;1.4, 5;1.6.3, 5;2.2, 5;2.4.10, 5;3.2.12 e), 5;3.3, 5;4.4, 7;1.6, 7;2.5, ~~,4;1.1.13~~, 7;2.9.3.1, 7;3.2.1, 7;3.2.4, 7;4.4 and 7;4.5; and

b) the requirements for excepted packages specified in 6;7.3; ~~and~~

except when the radioactive material possesses other hazardous properties and has to be classified in a class other than Class 7 in accordance with Special Provision A130 or A194, where the provisions listed in a) and b) above apply only as relevant and in addition to those relating to the main class or division.

~~c) if the excepted package contains fissile material, one of the fissile exceptions provided by 2;7.2.3.5 must apply and the requirement of 6;7.6.2 must be met.~~

6.1.5.2 Excepted packages ~~must be~~ are subject to the relevant provisions of all other parts of these Instructions. If the excepted package contains fissile material, one of the fissile exceptions provided by 2;7.2.3.5 applies and the requirements of 7;2.9.4.3 must be met.

6.2 RADIATION PROTECTION PROGRAMME

6.2.1 The transport of radioactive material must be subject to a radiation protection programme, which must consist of systematic arrangements aimed at providing adequate consideration of radiation protection measures.

UN Model Regulations, Chapter 1.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1.1 e)) and paragraph 2.1.1.1 of this report
Changes in addition to those introduced into the 18th Revised Edition of the Model Regulations are proposed here for the sake of alignment with the UN text.

6.2.2 Doses to persons must be below the relevant dose limits. Protection and safety must be optimized in order that the magnitude of individual doses, the number of persons exposed~~,~~ and the likelihood of incurring exposure must be kept as low as reasonably achievable, economic and social factors being taken into account~~, and doses to persons must be below the relevant dose limits~~, within the restriction that the doses to individuals are subject to dose constraints. A structured and systematic approach must be adopted and must include consideration of the interfaces between transport and other activities.

UN Model Regulations, Chapter 1.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.1 of this report) and paragraph 2.1.1.1 of this report

6.2.3 The nature and extent of the measures to be employed in the programme must be related to the magnitude and likelihood of radiation exposure. The programme must incorporate the requirements in 6.2.2 and 6.2.4 to 6.2.7, 7;2.9.1.1 and 7;2.9.1.2. Programme documents must be available, on request, for inspection by the relevant competent authority.

6.2.4 For occupational exposure arising from transport activities, where it is assessed that the effective dose either:

a) is likely to be between 1 and 6 mSv in a year, a dose assessment programme via workplace monitoring or individual monitoring must be conducted; ~~and~~ or

b) is likely to exceed 6 mSv in a year, individual monitoring must be conducted.

When individual monitoring or workplace monitoring is conducted, appropriate records must be kept.

Note.— For occupational exposure arising from transport activities, where it is assessed that the effective dose is most unlikely to exceed 1 mSv in a year, no special work patterns, detailed monitoring, dose assessment programmes or individual record-keeping need be required.

6.2.5 In the event of accidents or incidents during the transport of radioactive material, emergency provisions, as established by relevant national and/or international organizations, must be observed to protect persons, property and the environment. Appropriate guidelines for such provisions are contained in "Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material", IAEA Safety Standard Series No. TS-G-1.2 (ST-3), IAEA, Vienna (2002).

6.2.6 Emergency procedures must take into account the formation of other dangerous substances that may result from the reaction between the contents of a consignment and the environment in the event of an accident.

6.2.7 Personnel must be appropriately trained in the radiation hazards involved and the precautions to be observed in order to ensure restriction of their exposure and that of other persons who might be affected by their actions.

6.3 ~~QUALITY ASSURANCE~~MANAGEMENT SYSTEM

~~Quality assurance programmes based on international, national or other standards acceptable to the competent authority must be established and implemented for the design, manufacture, testing, documentation, use, maintenance and inspection of all special form radioactive material, low dispersible radioactive material and packages, and for transport and in-transit storage operations to ensure compliance with the relevant provisions of these Instructions. Certification that the design specification has been fully implemented must be available to the competent authority. The manufacturer, shipper or user must be prepared to provide facilities for competent authority inspection during manufacture and use and to demonstrate to any cognizant competent authority that:~~

~~a) the manufacturing methods and materials used are in accordance with the approved design specifications; and~~

~~b) all packagings are periodically inspected and, as necessary, repaired and maintained in good condition so that they continue to comply with all relevant requirements and specifications, even after repeated use.~~

A management system based on international, national or other standards acceptable to the competent authority must be established and implemented for all activities within the scope of the Instructions, as identified in 1;6.1.3, to ensure compliance with the relevant provisions of these Instructions. Certification that the design specification has been fully implemented must be available to the competent authority. The manufacturer, shipper or user must be prepared to:

a) provide facilities for inspection during manufacture and use; and

b) demonstrate compliance with these Instructions to the competent authority.

Where competent authority approval is required, such approval must take into account and be contingent upon the adequacy of the ~~quality assurance programme~~ management system.

6.4 SPECIAL ARRANGEMENT

6.4.1 Special arrangement means those provisions, approved by the competent authority, under which consignments which do not satisfy all the requirements of these Instructions applicable to radioactive material may be transported.

6.4.2 Consignments for which conformity with any provision applicable to ~~Class 7~~ radioactive material is impracticable must not be transported except under special arrangement. Provided the competent authority is satisfied that conformity with the ~~Class 7~~ radioactive material provisions of these Instructions is impracticable and that the requisite standards of safety established by these Instructions have been demonstrated through alternative means, the competent authority may approve special arrangement transport operations for a single consignment or a planned series of multiple consignments. The overall level of safety in transport must be at least equivalent to that which would be provided if all the applicable requirements had been met. For international consignments of this type, multilateral approval must be required.

6.5 RADIOACTIVE MATERIAL POSSESSING OTHER DANGEROUS PROPERTIES

6.5.1 In addition to the radioactive and fissile properties, any subsidiary risk of the contents of a package, such as explosiveness, flammability, pyrophoricity, chemical toxicity and corrosiveness, must also be taken into account in the documentation, packing, labelling, marking, placarding, stowage, segregation and transport, in order to be in compliance with all relevant provisions for dangerous goods of these Instructions.

6.6 NON-COMPLIANCE

In the event of ~~a~~ non-compliance with any limit in these Instructions applicable to radiation level or contamination:

a) the shipper, consignee, operator and any organization involved during transport, who may be affected, as appropriate, must be informed of the non-compliance:

~~a~~i) ~~the shipper must be informed of the non-compliance~~ by the operator if the non-compliance is identified during transport; or

~~b~~ii) ~~the shipper and the operator must be informed of the non-compliance~~ by the consignee if the non-compliance is identified at receipt;

~~c~~b) the operator, shipper or consignee, as appropriate, must:

i) take immediate steps to mitigate the consequences of the non-compliance;

ii) investigate the non-compliance and its causes, circumstances and consequences;

iii) take appropriate action to remedy the causes and circumstances that led to the non-compliance and to prevent a recurrence of similar circumstances that led to the non-compliance; and

iv) communicate to the relevant competent authority(ies) the causes of the non-compliance and corrective or preventative actions taken or to be taken; ~~and~~

~~d~~c) the communication of the non-compliance to the shipper and relevant competent authority(ies), respectively, must be made as soon as practicable and it must be immediate whenever an emergency exposure situation has developed or is developing.

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Part 2

CLASSIFICATION OF DANGEROUS GOODS

INTRODUCTORY CHAPTER

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2. CLASSES, DIVISIONS, PACKING GROUPS — DEFINITIONS

2.4 For packing purposes, dangerous goods other than those of Classes 1, 2 and 7, Divisions 5.2 and 6.2 and self-reactive substances of Division 4.1 are assigned to three packing groups in accordance with the degree of danger they present:

Packing Group I: Substances presenting high danger

Packing Group II: Substances presenting medium danger

Packing Group III: Substances presenting low danger

The packing group to which a substance is assigned is indicated in the Dangerous Goods List in Part 3, Chapter 2, Table 3-1.

UN Model Regulations, paragraph 2.0.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13.1) and paragraph 2.2.1.1 of this report

Articles are not assigned to packing groups. For packing purposes, any requirement for a specific packaging performance level is set out in the applicable packing instruction.

4. PRECEDENCE OF HAZARD CHARACTERISTICS

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UN Model Regulations, paragraph 2.0.3.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13.1) and paragraph 2.2.1.1 of this report

4.2 Apart from radioactive material in excepted packages (where the other hazardous properties take precedence), radioactive material having other hazardous properties must always be classified in Class 7 and the subsidiary risk must also be identified. For radioactive material in excepted packages, except for UN 3507, **Uranium hexafluoride, radioactive material, excepted package**, Special Provision A130 applies.

4.3 An article which, apart from its other hazards, also meets the criterion for a magnetized material, must be identified in accordance with the provisions of this section and in addition as a magnetized material.

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Chapter 2

CLASS 2 — GASES

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UN Model Regulations, paragraph 2.2.1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

2.1.2 The transport condition of a gas is described according to its physical state as:

a) compressed gas — a gas which when packaged under pressure for transport is entirely gaseous at –50°C; this category includes all gases with a critical temperature less than or equal to –50°C;

b) liquefied gas — a gas which when packaged under pressure for transport is partially liquid at temperatures above –50°C. A distinction is made between:

High pressure liquefied gas: a gas with a critical temperature between –50°C and +65°C, and

Low pressure liquefied gas: a gas with a critical temperature above +65°C;

c) refrigerated liquefied gas — a gas which when packaged for transport is made partially liquid because of its low temperature; or

d) dissolved gas — a gas which when packaged under pressure for transport is dissolved in a liquid phase solvent.

e) adsorbed gas — a gas which when packaged for transport is adsorbed onto a solid porous material resulting in an internal receptacle pressure of less than 101.3 kPa at 20°C and less than 300 kPa at 50°C.

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UN Model Regulations, paragraphs 2.2.2.4, ST/SG/AC.10/86/Add.1 and paragraph 2.1.2 of this report

2.2.3 Gases of Division 2.2 are not subject to these Instructions when contained in the following:

a) foodstuffs, including carbonated beverages (except UN 1950);

b) balls intended for use in sports; or

c) tyres which meet the provisions of Special Provision A59~~; or~~.

~~d) light bulbs, provided they are packaged so that the projectile effects of any rupture of the bulb will be contained within the package.~~

Note.— This exemption does not apply to lamps. For lamps see 1;2.6.

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Chapter 3

CLASS 3 — FLAMMABLE LIQUIDS

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3.2 ASSIGNMENT OF PACKING GROUPS

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UN Model Regulations, paragraphs 2.3.2.2 and 2.3.2.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

~~3.2.2 Criteria for inclusion in Packing Group III~~

3.2.2 Viscous flammable liquids such as paints, enamels, lacquers, varnishes, adhesives and polishes ~~with~~ having a flash point of less than 23°C may be assigned to Packing Group III in conformity with the procedures prescribed in Part III, subsection 32.3 of the UN *Manual of Tests and Criteria* provided that:

~~a~~b) less than 3 per cent of the clear solvent layer separates in the solvent separation test;

~~b~~c) the mixture or any separated solvent does not meet the criteria for Division 6.1 or Class 8;

~~c~~a) the viscosity expressed as the flowtime in seconds and flash point are in accordance with Table 2-5;

d) ~~when assigned to Packing Group III, the flammable liquids must not exceed a~~ the net quantity per package ~~of~~ does not exceed 30 L for passenger aircraft or 100 L for cargo aircraft.

3.2.3 Substances classified as flammable liquids due to their being transported or offered for transport at elevated temperatures are included in Packing Group III.

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Chapter 4

CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

. . .

4.4 SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES (DIVISION 4.3)

4.4.1 Definitions and properties

DGP/24-WP/43 (paragraph 2.1.2.1 f) of this report

4.4.1.1 Division 4.3 — Substances which, in contact with water, emit flammable gases.

4.4.1.2 Certain substances in contact with water emit flammable gases which can form explosive mixtures with air. Such mixtures are easily ignited by all ordinary sources of ignition, for example, naked lights, sparking handtools or unprotected ~~light bulbs~~ lamps. The resulting blast wave and flames may endanger people and the environment. The test method referred to in 4.4.2 must be used to determine whether the reaction of a substance with water leads to the development of a dangerous amount of gases which may be flammable. It must not be applied to pyrophoric substances.

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Chapter 5

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

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5.2 OXIDIZING SUBSTANCES (DIVISION 5.1)

5.2.1 Classification in Division 5.1

5.2.1.1 Oxidizing substances are classified in Division 5.1 in accordance with the test methods, procedures and criteria in 5.2.2, 5.2.3 and the UN *Manual of Tests and Criteria,* Part III, section 34. In the event of divergence between test results and known experience, the appropriate authority of the State of Origin must be consulted to establish the appropriate classification and packing group.

Note.— Where substances of this division are listed in the Dangerous Goods List in 3;2, reclassification of those substances in accordance with these criteria need only be undertaken when this is necessary for safety.

UN Model Regulations, paragraph 2.5.2.2.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

5.2.2 Oxidizing solids

5.2.2.1 *Criteria for classification in Division 5.1*

5.2.2.1.1 Tests are performed to measure the potential for a solid substance to increase the burning rate or burning intensity of a combustible substance when the two are thoroughly mixed. The procedure is given in the UN *Manual of Tests and Criteria*, Part III, subsection 34.4.1(test O.1) or alternatively, in subsection 34.4.3 (test O.3). Tests are conducted on the substance to be evaluated mixed with dry fibrous cellulose in mixing ratios of 1:1 and 4:1, by mass, of sample to cellulose. The burning characteristics of the mixtures are compared-:

a) in the test O.1, with the standard 3:7 mixture, by mass, of potassium bromate to cellulose. If the burning time is equal to or less than this standard mixture, the burning times should be compared with those from the Packing Group I or II reference standards, 3:2 and 2:3 ratios, by mass, of potassium bromate to cellulose, respectively-; or

b) in the test O.3, with the standard 1:2 mixture, by mass, of calcium peroxide to cellulose. If the burning rate is equal to or greater than this standard mixture, the burning rates must be compared with those from the Packing Group I or II reference standards 3:1 and 1:1 ratios, by mass, of calcium peroxide to cellulose, respectively.

UN Model Regulations, paragraph 2.5.2.2.1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

5.2.2.1.2 The classification test results are assessed on the basis of:

a) the comparison of the mean burning time (for the test O.1) or burning rate (for the test O.3) with those of the reference mixtures; and

b) whether the mixture of substance and cellulose ignites and burns.

UN Model Regulations, paragraph 2.5.2.2.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

5.2.2.1.3 A solid substance is classified in Division 5.1 if the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits:

a) in the test O.1,a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose- or

b) in the test O.3, a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose.

UN Model Regulations, paragraph 2.5.2.2.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

5.2.2.2 Assignment of packing groups

Solid oxidizing substances are assigned to a packing group according to one of the test procedures in the UN *Manual of Tests and Criteria*, Part III, section 34.4.1 (Test O.1) or alternatively, in subsection 34.4.3 (Test O.3), in accordance with the following criteria:

a) Test O.1:

i) Packing Group I: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time less than the mean burning time of a 3:2 mixture, by mass, of potassium bromate and cellulose;

~~b~~ii) Packing Group II: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 2:3 mixture (by mass) of potassium bromate and cellulose and the criteria for Packing Group I are not met;

~~c~~iii) Packing Group III: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning time equal to or less than the mean burning time of a 3:7 mixture (by mass) of potassium bromate and cellulose and the criteria for Packing Groups I and II are not met;

~~d~~iv) Not Division 5.1: any substance which, in both the 4:1 and 1:1 sample-to-cellulose ratio (by mass) tested, does not ignite and burn, or exhibits mean burning times greater than that of a 3:7 mixture (by mass) of potassium bromate and cellulose.

b) Test O.3:

i) Packing Group I: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate greater than the mean burning rate of a 3:1 mixture (by mass) of calcium peroxide and cellulose;

(ii) Packing Group II: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:1 mixture (by mass) of calcium peroxide and cellulose, and the criteria for Packing Group I are not met;

(iii) Packing Group III: any substance which, in the 4:1 or 1:1 sample-to-cellulose ratio (by mass) tested, exhibits a mean burning rate equal to or greater than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose, and the criteria for Packing Groups I and II are not met;

(iv) Not Division 5.1: any substance which, in both the 4:1 and 1:1 sample-to-cellulose ratio (by mass) tested, does not ignite and burn, or exhibits a mean burning rate less than the mean burning rate of a 1:2 mixture (by mass) of calcium peroxide and cellulose.

DGP/24-WP/3 (see paragraph 3.2.13.1 a)) and paragraph 2.2.1.1 of this report

5.2.3 Oxidizing liquids

5.2.3.1 *Criteria for classification in Division 5.1*

5.2.3.1.1 A test is performed to determine the potential for a liquid substance to increase the burning rate or burning intensity of a combustible substance or for spontaneous ignition to occur when the two are thoroughly mixed. The procedure is given in the UN *Manual of Tests and Criteria*, Part III, subsection 34.4.2 (Test O.2). It measures the pressure rise time during combustion. Whether a liquid is an oxidizing substance of Division 5.1 and, if so, whether Packing Group I, II or III must be assigned, is decided on the basis of the test result (see also precedence of hazards characteristics).

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Chapter 6

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

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6.3 DIVISION 6.2 — INFECTIOUS SUBSTANCES

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6.3.2 Classification of infectious substances

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6.3.2.3 *Exceptions*

6.3.2.3.1 Substances which do not contain infectious substances or substances which are unlikely to cause disease in humans or animals are not subject to these Instructions unless they meet the criteria for inclusion in another class.

6.3.2.3.2 Substances containing micro-organisms which are non-pathogenic to humans or animals are not subject to these Instructions unless they meet the criteria for inclusion in another class.

6.3.2.3.3 Substances in a form that any present pathogens have been neutralized or inactivated such that they no longer pose a health risk are not subject to these Instructions unless they meet the criteria for inclusion in another class.

6.3.2.3.4 Environmental samples (including food and water samples) which are not considered to pose a significant risk of infection are not subject to these Instructions unless they meet the criteria for inclusion in another class.

UN Model Regulations, paragraphs 2.6.3.2.3.5, 2.6.3.2.3.6 and 2.6.3.2.3.7, ST/SG/AC.10/40/Add.1 and paragraph 2.2.1.1 of this report

6.3.2.3.5 Dried blood spots, collected by applying a drop of blood onto absorbent material~~, or~~ are not subject to these Instructions.

6.3.2.3.6 ~~f~~Faecal occult blood screening ~~tests and~~ samples are not are not subject to these Instructions.

6.3.2.3.7 ~~b~~Blood or blood components that have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation as well as samples drawn in connection with such purposes are not subject to these Instructions.

See paragraph 2.2.1.2 of this report and DGP/24-WP/24 (paragraph 2.2.3 of this report)

6.3.2.3.~~6~~8 Patient specimens for which there is minimal likelihood that pathogens are present are not subject to other provisions of these Instructions ~~if the specimen is transported in a packaging which will prevent any leakage and which is marked with the words "Exempt human specimen" or "Exempt animal specimen", as appropriate. The packaging must meet the following conditions~~`provided:

a) The specimen is transported in a packaging which will prevent any leakage and which is marked with the words "Exempt human specimen" or "Exempt animal specimen", as appropriate;

b) The packaging must consist of three components:

i) a leakproof primary receptacle(s);

ii) a leakproof secondary packaging; and

iii) an outer packaging of adequate strength for its capacity, mass and intended use, and with at least one surface having minimum dimensions of 100 mm × 100 mm;

~~b~~c) For liquids, absorbent material in sufficient quantity to absorb the entire contents must be placed between the primary receptacle(s) and the secondary packaging so that, during transport, any release or leak of a liquid substance will not reach the outer packaging and will not compromise the integrity of the cushioning material;

~~c~~d) When multiple fragile primary receptacles are placed in a single secondary packaging, they must be either individually wrapped or separated to prevent contact between them.

e) If refrigerated or frozen specimens are to be transported the, following conditions must be met:

i) when dry ice or liquid nitrogen is used to keep specimens cold, all applicable requirements of these Instructions must be met. When used, ice or dry ice must be placed outside the secondary packaging or in the outer packaging. Interior supports must be provided to secure the secondary packaging in the original position after the ice or dry ice has dissipated. If ice is used, the outside packaging must be leakproof. If carbon dioxide, solid (dry ice) is used, the packaging must be designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packagings;

ii) the primary receptacle and the secondary packaging must maintain their integrity at the temperature of the refrigerant used as well as the temperatures and the pressures which could result if refrigeration were lost.

Note.— In determining whether a patient specimen has a minimum likelihood that pathogens are present, an element of professional judgement is required to determine if a substance is exempt under this paragraph. That judgement should be based on the known medical history, symptoms and individual circumstances of the source, human or animal, and endemic local conditions. Examples of specimens which may be transported under this paragraph include blood or urine tests to monitor cholesterol levels, blood glucose levels, hormone levels, or prostate specific antibodies (PSA); tests required to monitor organ function such as heart, liver or kidney function for humans or animals with non-infectious diseases, or therapeutic drug monitoring; tests conducted for insurance or employment purposes and are intended to determine the presence of drugs or alcohol; pregnancy tests; biopsies to detect cancer; and antibody detection in humans or animals in the absence of any concern for infection (e.g. evaluation of vaccine induced immunity, diagnosis of autoimmune disease, etc.).

6.3.2.3.~~7~~9 Except for:

a) medical waste (UN 3291);

b) medical devices or equipment contaminated with or containing infectious substances in Category A (UN 2814 or UN 2900); and

c) medical devices or equipment contaminated with or containing other dangerous goods that meet the definition of another hazard class,

medical devices or equipment potentially contaminated with or containing infectious substances which are being transported for disinfection, cleaning, sterilization, repair, or equipment evaluation are not subject to the provisions of these Instructions if packed in packagings designed and constructed in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents. Packagings must be designed to meet the construction requirements listed in 6;3.

DGP/24-WP/6, paragraph 2.2.2 of this report

6.3.2.3.~~7~~9.1 Medical devices or equipment must be drained of free liquid to the extent practicable. They must be packed in a strong rigid outer packaging fitted with sufficient cushioning material to prevent movement within the outer packaging. These packagings must meet the general packing requirements of 4;1.1.1, 4;1.1.3.1 and 4;1.1.4 (with the exception of 4;1.1.4.1). If the outer packaging is not liquid tight and the medical devices or equipment are contaminated with or contain liquid infectious substances, a means of containing the liquid in the event of leakage must be provided in the form of a leakproof liner, plastic bag or other equally effective means of containment. These packagings must be capable of retaining the medical devices and equipment when dropped from a height of 1.2 m.

Note.— A packaging's capability of retaining medical devices or equipment when dropped from a height of 1.2 m should be determined through testing a sample package as prepared for transport or through alternative means such as non-destructive testing and engineering analysis, testing with an article of similar mass and size, or other equivalent means.

6.3.2.3.~~7~~9.2 Packages must be marked "Used medical device" or "Used medical equipment". When an overpack is used, it must be marked with the words "Used medical device" or "Used medical equipment" unless the markings are visible.

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Chapter 7

CLASS 7 — RADIOACTIVE MATERIAL

Parts of this Chapter are affected by State Variations BE 4, CA 1, CA 3, CA 4, CH 4 DE 3, DK 1, DQ 1, IR 4, JP 26, KG 1; see Table A-1

Note.— For Class 7, the type of packaging may have a decisive effect on classification.

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7.1.3 Definitions of specific terms

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UN Model Regulations, paragraph 2.7.1.3, ST/SG/AC.10/40/Add.1 and paragraph 2.2.1.3 of this report

Fissile nuclides. Uranium-233, uranium-235, plutonium-239 and plutonium-241. Fissile material is a material containing any of the fissile nuclides. Excluded from the definition of fissile material are the following:

a) natural uranium or depleted uranium which is unirradiated; ~~and~~

b) natural uranium or depleted uranium which has been irradiated in thermal reactors only~~.~~;

c) material with fissile nuclides less than a total of 0.25 g;

d) any combination of a), b) and/or c).

These exclusions are only valid if there is no other material with fissile nuclides in the package.

UN Model Regulations, paragraph 1.2.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13.1 c)) and paragraph 2.2.1.1 of this report

Freight container in the case of radioactive material transport. An article of transport equipment designed to facilitate the transport of packaged goods by one or more modes of transport without intermediate reloading, which is of a permanent enclosed character, rigid and strong enough for repeated use, and must be fitted with devices facilitating its handling, particularly in transfer between aircraft and from one mode of transport to another. In addition, ~~A~~a small freight container is that which has ~~either an overall outer dimension less than 1.5 m, or~~ an internal volume of not more than 3 m^3. A large freight container is that which has an internal volume of more than 3 m^3.~~Any other freight container is considered to be a large freight container.~~ For the transport of Class 7 material, a freight container may be used as a packaging.

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Surface contaminated object (SCO). A solid object which is not itself radioactive but which has radioactive material distributed on its ~~surfaces~~ surface.

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7.2 CLASSIFICATION

7.2.1 General provisions

UN Model Regulations, paragraph 2.7.2.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.1.1 Radioactive material must be assigned to one of the UN numbers specified in Table 2-11 ~~depending on the activity level of the radionuclides contained in a package, the fissile or non-fissile properties of these radionuclides, the type of package to be presented for transport and the nature or form of the contents of the package, or special arrangements~~

~~governing the transport operation, in accordance with the provisions laid down in 7.2.2 to 7.2.5~~ in accordance with 7.2.4.2 to 7.2.4.5, taking into account the material characteristics determined in 7.2.3.

UN Model Regulations, Table 2.7.2.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

Table 2-11. Assignment of UN numbers

UN number	*Proper shipping n~~N~~ame and description*[a]
Excepted packages (1;6.1.5)	
UN 2908	**Radioactive material, excepted package — empty packaging**
UN 2909	**Radioactive material, excepted package — articles manufactured from natural uranium** or **depleted uranium** or **natural thorium**
UN 2910	**Radioactive material, excepted package — limited quantity of material**
UN 2911	**Radioactive material, excepted package — instruments** or **articles**
UN 3507	**Uranium hexafluoride, radioactive material, excepted package**, less than 0.1 kg per package, non-fissile or fissile-excepted[b,c]
Low specific activity radioactive material (7.2.3.1)	
UN 2912	**Radioactive material, low specific activity (LSA-I)**, non-fissile or fissile excepted[b]
UN 3321	**Radioactive material, low specific activity (LSA-II)**, non-fissile or fissile excepted[b]
UN 3322	**Radioactive material, low specific activity (LSA-III)**, non-fissile or fissile excepted[b]
UN 3324	**Radioactive material, low specific activity (LSA-II) fissile**
UN 3325	**Radioactive material, low specific activity (LSA-III) fissile**
Surface contaminated objects (7.2.3.2)	
UN 2913	**Radioactive material, surface contaminated objects (SCO-I** or **SCO-II)**, non-fissile or fissile excepted[b]
UN 3326	**Radioactive material, surface contaminated objects (SCO-I** or **SCO-II), fissile**
Type A packages (7.2.4.4)	
UN 2915	**Radioactive material, Type A package**, non-special form, non-fissile or fissile excepted[b]
UN 3327	**Radioactive material, Type A package, fissile**, non-special form
UN 3332	**Radioactive material, Type A package, special form**, non-fissile or fissile excepted[b]
UN 3333	**Radioactive material, Type A package, special form, fissile**
Type B(U) package (7.2.4.6)	
UN 2916	**Radioactive material, Type B(U) package**, non-fissile or fissile excepted[b]
UN 3328	**Radioactive material, Type B(U) package, fissile**
Type B(M) package (7.2.4.6)	
UN 2917	**Radioactive material, Type B(M) package**, non-fissile or fissile excepted[b]
UN 3329	**Radioactive material, Type B(M) package, fissile**
Type C package (7.2.4.6)	
UN 3323	**Radioactive material, Type C package**, non-fissile or fissile excepted[b]
UN 3330	**Radioactive material, Type C package, fissile**
Special arrangement (7.2.5)	
UN 2919	**Radioactive material, transported under special arrangement**, non-fissile or fissile excepted[b]
UN 3331	**Radioactive material, transported under special arrangement, fissile**

UN number	*Proper shipping nName and description*[a]
Uranium hexafluoride (7.2.4.5)	
UN 2977	**Radioactive material, uranium hexafluoride, fissile**
UN 2978	**Radioactive material, uranium hexafluoride**, non-fissile or fissile excepted[b]
UN 3507	**Uranium hexafluoride, radioactive material, excepted package** less than 0.1 kg per package, non-fissile or fissile-excepted[b,c]

a The proper shipping name is found in the column "proper shipping name and description" and is restricted to that part shown in bold letters. In the cases of UN Nos. 2909, 2911, 2913 and 3326, where alternative proper shipping names are separated by the word "or", only the relevant proper shipping name must be used

b The term "fissile-excepted" refers only to material excepted under 7.2.3.5.

c For UN No. 3507, see also Special Provision A194.

7.2.2 Determination of activity level

UN Model Regulations, paragraph 2.7.2.2.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.2.1 The following basic values for individual radionuclides are given in Table 2-12:

a) A_1 and A_2 in TBq;

b) activity concentration limits for exempt material in Bq/g; and

c) activity limits for exempt consignments in Bq.

UN Model Regulations, paragraph 2.7.2.2.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.2.2 For individual radionuclides-:

a) which are not listed in Table 2-12, determination of the basic radionuclide values referred to in 7.2.2.1 requires multilateral approval. For these radionuclides, activity concentration limits for exempt material and activity limits for exempt consignments must be calculated in accordance with the principles established in the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*, Safety Series No.115, IAEA, Vienna (1996). It is permissible to use the A_2 value calculated using a dose coefficient for the appropriate lung absorption type as recommended by the International Commission on Radiological Protection, if the chemical forms of each radionuclide under both normal and accident conditions of transport are taken into consideration. Alternatively, the radionuclide values in Table 2-13 may be used without obtaining competent authority approval.

b) in instruments or articles in which the radioactive material is enclosed or is included as a component part of the instrument or other manufactured article and which meet 7.2.4.1.1.3 c), alternative basic radionuclide values to those in Table 2-12 for the activity limit for an exempt consignment are permitted and require multilateral approval. Such alternative activity limits for an exempt consignment must be calculated in accordance with the principles set out in the *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources*, Safety Series No.115, IAEA, Vienna (1996).

7.2.2.3 In the calculations of A_1 and A_2 for a radionuclide not in Table 2-12, a single radioactive decay chain in which the radionuclides are present in their naturally occurring proportions, and in which no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide, must be considered as a single radionuclide; and the activity to be taken into account and the A_1 or A_2 value to be applied must be that corresponding to the parent nuclide of that chain. In the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or greater than that of the parent nuclide, the parent and such daughter nuclides must be considered as mixtures of different nuclides.

UN Model Regulations, paragraph 2.7.2.2.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.2.4 For mixtures of radionuclides, ~~the determination of~~ the basic radionuclide values referred to in 7.2.2.1 may be determined as follows:

$$X_m = \frac{1}{\sum_i \frac{f(i)}{X(i)}}$$

where,

f(i) is the fraction of activity or activity concentration of radionuclide i in the mixture;

X(i) is the appropriate value of A_1 or A_2 or the activity concentration limit for exempt material or the activity limit for an exempt consignment as appropriate for the radionuclide i; and

X_m is the derived value of A_1 or A_2 or the activity concentration limit for exempt material or the activity limit for an exempt consignment in the case of a mixture.

7.2.2.5 When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped and the lowest radionuclide value, as appropriate, for the radionuclides in each group may be used in applying the formulas in 7.2.2.4 and 7.2.4.4. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest radionuclide values for the alpha emitters or beta/gamma emitters, respectively.

7.2.2.6 For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in Table 2-13 must be used.

UN Model Regulations, Table 2.7.2.2.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

Table 2-12. Basic radionuclides values for individual radionuclides

Radionuclide (atomic number)	*Special form A_1 (TBq)*	*Other form A_2 (TBq)*	*Activity concentration limit for exempt material (Bq/g)*	*Activity limit for an exempt consignment (Bq)*
Actinium (89)				
. . .				
Zr-97 (a)	4×10^{-1}	4×10^{-1}	1×10^{1} (b)	1×10^{5} (b)
(a) A_1 and/or A_2 values for these parent radionuclides include contributions ~~from daughter radionuclides~~ from their progeny with half-lives less than 10 days, as listed in the following:				
. . .				

UN Model Regulations, Table 2.7.2.2.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

Table 2-13. Basic radionuclide values for unknown radionuclides or mixtures

Radioactive contents	*A_1 (Tbq)*	*A_2 (Tbq)*	*Activity concentration limit for exempt material (Bq/g)*	*Activity limit for an exempt consignment (Bq)*
Only beta- or gamma-emitting nuclides are known to be present	0.1	0.02	1×10^{1}	1×10^{4}
Alpha-emitting nuclides but no neutron emitters are known to be present	0.2	9×10^{-5}	1×10^{-1}	1×10^{3}
Neutron-emitting nuclides are known to be present or no relevant data are available	0.001	9×10^{-5}	1×10^{-1}	1×10^{3}

7.2.3 Determination of other material characteristics

7.2.3.1 *Low specific activity (LSA) material*

7.2.3.1.1 (Reserved)

UN Model Regulations, paragraph 2.7.2.3.1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.3.1.2 LSA material must be in one of three groups:

a) LSA-I

i) uranium and thorium ores and concentrates of such ores, and other ores containing naturally occurring radionuclides ~~which are intended to be processed for the use of these radionuclides~~;

ii) natural uranium, depleted uranium, natural thorium, or their compounds or mixtures, that are unirradiated and in solid or liquid form;

iii) radioactive material for which the A_2 value is unlimited~~, excluding f~~Fissile material may be included only if ~~not~~ excepted under 7.2.3.5; or

iv) other radioactive material in which the activity is distributed throughout and the estimated average specific activity does not exceed 30 times the values for activity concentration specified in 7.2.2.1 to 7.2.2.6~~, excluding .~~ ~~f~~Fissile material ~~not~~ may be included only if excepted under 7.2.3.5.

b) LSA-II

i) water with tritium concentration up to 0.8 TBq/L; ~~or~~

ii) other material in which the activity is distributed throughout and the estimated average specific activity does not exceed 10^{-4} A_2/g for solids and gases, and 10^{-5} A_2/g for liquids.

c) LSA-III — solids (e.g. consolidated wastes, activated materials), excluding powders that meet~~ing~~ the requirements of 7.2.3.1.3, in which:

i) the radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen~~,~~ and ceramic~~, etc.~~);

ii) the radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble matrix, so that, even under loss of packaging, the loss of radioactive material per package by leaching when placed in water for seven days would not exceed 0.1 A_2; and

iii) the estimated average specific activity of the solid, excluding any shielding material, does not exceed 2×10^{-3} A_2/g.

7.2.3.1.3 LSA-III material must be a solid of such a nature that if the entire contents of a package were subjected to the test specified in 7.2.3.1.4, the activity in the water would not exceed 0.1 A_2.

7.2.3.1.4 LSA-III material must be tested as follows:

A solid material sample representing the entire contents of the package must be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test must be sufficient to ensure that at the end of the 7-day test period, the free volume of the unabsorbed and unreacted water remaining must be at least 10 per cent of the volume of the solid test sample itself. The water must have an initial pH of 6-8 and a maximum conductivity of 1 mS/m at 20°C. The total activity of the free volume of water must be measured following the 7-day immersion of the test sample.

7.2.3.1.5 Demonstration of compliance with the performance standards in 7.2.3.1.4 must be in accordance with 6;7.11.1 and 6;7.11.2.

UN Model Regulations, paragraph 2.7.2.3.2, ST/SG/AC.10/40/Add.1 and ST/SG/AC.10/C.3/86/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.3.2 S*urface contaminated object (SCO)*

7.2.3.2.1 SCO is classified in one of two groups:

a) SCO-I: A solid object on which:

i) the non-fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 0.4 Bq/cm^2 for all other alpha emitters; ~~and~~

ii) the fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4×10^4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 4×10^3 Bq/cm^2 for all other alpha emitters; ~~and~~ or

iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 4×10^4 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 4×10^3 Bq/cm^2 for all other alpha emitters;

b) SCO-II: A solid object on which either the fixed or non-fixed contamination on the surface exceeds the applicable limits specified for SCO-I in a) above and on which:

i) the non-fixed contamination on the accessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 400 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 40 Bq/cm^2 for all other alpha emitters; ~~and~~

ii) the fixed contamination on the accessible surface, averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8×10^5 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm^2 for all other alpha emitters; ~~and~~ or

iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over 300 cm^2 (or the area of the surface if less than 300 cm^2) does not exceed 8×10^5 Bq/cm^2 for beta and gamma emitters and low toxicity alpha emitters, or 8×10^4 Bq/cm^2 for all other alpha emitters.

7.2.3.3 *Special form radioactive material*

7.2.3.3.1 Special form radioactive material must have at least one dimension not less than 5 mm. When a sealed capsule constitutes part of the special form radioactive material, the capsule must be so manufactured that it can be opened only by destroying it. The design for special form radioactive material requires unilateral approval.

7.2.3.3.2 Special form radioactive material must be of such a nature or must be so designed that if it is subjected to the tests specified in 7.2.3.3.4 to 7.2.3.3.8, it must meet the following requirements:

a) it would not break or shatter under the impact, percussion and bending tests specified in 7.2.3.3.5 a), b), c) or 7.2.3.3.6 a), as applicable;

b) it would not melt or disperse in the applicable heat test specified in 7.2.3.3.5 d) or 7.2.3.3.6 b), as applicable; ~~and~~ or

c) the activity in the water from the leaching tests specified in 7.2.3.3.7 and 7.2.3.3.8 would not exceed 2 kBq; or alternatively for sealed sources, the leakage rate for the volumetric leakage assessment test specified in ISO 9978:1992 "Radiation Protection — Sealed Radioactive Sources — Leakage Test Methods", would not exceed the applicable acceptance threshold acceptable to the competent authority.

7.2.3.3.3 Demonstration of compliance with the performance standards in 7.2.3.3.2 must be in accordance with 6;7.11.1 and 6;7.11.2.

7.2.3.3.4 Specimens that comprise or simulate special form radioactive material must be subjected to the impact test, the percussion test, the bending test, and the heat test specified in 7.2.3.3.5 or alternative tests as authorized in 7.2.3.3.6. A different specimen may be used for each of the tests. Following each test, a leaching assessment or volumetric leakage test must be performed on the specimen by a method no less sensitive than the methods given in 7.2.3.3.7 for indispersible solid material or 7.2.3.3.8 for encapsulated material.

7.2.3.3.5 The relevant test methods are:

a) Impact test: The specimen must drop onto the target from a height of 9 m. The target must be as defined in 6;7.13;

b) Percussion test: The specimen must be placed on a sheet of lead which is supported by a smooth, solid surface and struck by the flat face of a mild steel bar so as to cause an impact equivalent to that resulting from a free drop of 1.4 kg through 1 m. The lower part of the bar must be 25 mm in diameter with the edges rounded off to a radius of (3.0 ± 0.3) mm. The lead, of hardness number 3.5 to 4.5 on the Vickers scale and not more than 25 mm thick, must cover an area greater than that covered by the specimen. A fresh surface of lead must be used for each impact. The bar must strike the specimen so as to cause maximum damage.

c) Bending test: The test must apply only to long, slender sources with both a minimum length of 10 cm and a length to minimum width ratio of not less than 10. The specimen must be rigidly clamped in a horizontal position so that one-half of its length protrudes from the face of the clamp. The orientation of the specimen must be such that the specimen will suffer maximum damage when its free end is struck by the flat face of a steel bar. The bar must strike the specimen so as to cause an impact equivalent to that resulting from a free vertical drop of 1.4 kg through 1 m. The lower part of the bar must be 25 mm in diameter with the edges rounded off to a radius of (3.0 ± 0.3) mm.

d) Heat test: The specimen must be heated in air to a temperature of 800°C and held at that temperature for a period of 10 minutes and must then be allowed to cool.

UN Model Regulations, paragraph 2.7.2.3.3.6, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraphs 2.2.1.1 and 2.2.1.4 of this report

7.2.3.3.6 Specimens that comprise or simulate radioactive material enclosed in a sealed capsule may be excepted from:

a) the tests prescribed in 7.2.3.3.5 a) and b) provided ~~the mass of the special form radioactive material is~~ that the specimens are alternatively subjected to the impact test prescribed in ISO 2919:2012: "Radiation Protection — Sealed Radioactive Sources — General requirements and classification":

i) ~~less than 200 g and the specimens are alternatively subjected to~~ the Class 4 impact test ~~prescribed in ISO 2919:1999 "Radiation protection — Sealed radioactive sources — General requirements and classification"~~ if the mass of the special form radioactive material is less than 200 g; or

ii) ~~less than 500 g and the specimens are alternatively subjected to~~ the Class 5 impact test ~~prescribed in ISO 2919:1999 "Radiation protection — Sealed radioactive sources — General requirements and classification"~~ if the mass of the special form radioactive material is 200 g or more but less than 500 g; and

b) the test prescribed in 7.2.3.3.5 d) provided the specimens are alternatively subjected to the Class 6 temperature test specified in ISO ~~2919:1999~~ ISO 2919:2012 "Radiation protection — Sealed radioactive sources — General requirements and classification".

7.2.3.3.7 For specimens which comprise or simulate indispersible solid material, a leaching assessment must be performed as follows:

a) The specimen must be immersed for 7 days in water at ambient temperature. The volume of water to be used in the test must be sufficient to ensure that at the end of the 7-day test period, the free volume of the unabsorbed and unreacted water remaining must be at least 10 per cent of the volume of the solid test sample itself. The water must have an initial pH of 6-8 and a maximum conductivity of 1 mS/m at 20°C;

b) The water with the specimen must then be heated to a temperature of (50 ± 5)°C and maintained at this temperature for 4 hours;

c) The activity of the water must then be determined;

d) The specimen must then be kept for at least 7 days in still air at not less than 30°C and relative humidity not less than 90 per cent;

e) The specimen must then be immersed in water of the same specification as in a) above and the water with the specimen heated to (50 ± 5)°C and maintained at this temperature for 4 hours;

f) The activity of the water must then be determined.

UN Model Regulations, paragraph 2.7.2.3.3.8, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.3.3.8 For specimens which comprise or simulate radioactive material enclosed in a sealed capsule, either a leaching assessment or a volumetric leakage assessment must be performed as follows:

a) The leaching assessment must consist of the following steps:

   i) the specimen must be immersed in water at ambient temperature. The water must have an initial pH of 6-8 with a maximum conductivity of 1 mS/m at 20°C;

   ii) the water and specimen must be heated to a temperature of (50 ± 5)°C and maintained at this temperature for 4 hours;

   iii) the activity of the water must then be determined;

   iv) the specimen must then be kept for at least 7 days in still air at not less than 30°C and relative humidity of not less than 90 per cent;

   v) the process in i), ii) and iii) must be repeated;

b) The alternative volumetric leakage assessment must comprise any of the tests prescribed in ISO 9978:1992 “Radiation protection — Sealed radioactive sources — Leakage test methods”, ~~which are~~ provided that they are acceptable to the competent authority.

7.2.3.4 *Low dispersible radioactive material*

7.2.3.4.1 The design for low dispersible radioactive material requires multilateral approval. Low dispersible radioactive material must be such that the total amount of this radioactive material in a package, taking into account the provisions of 6;7.7.14, must meet the following requirements:

a) The radiation level at 3 m from the unshielded radioactive material does not exceed 10 mSv/h;

b) If subjected to the tests specified in 6;7.19.3 and 6;7.19.4, the airborne release in gaseous and particulate forms of up to 100 μm aerodynamic equivalent diameter would not exceed 100 A_2. A separate specimen may be used for each test; and

c) If subjected to the test specified in 7.2.3.1.4, the activity in the water would not exceed 100 A_2. In the application of this test, the damaging effects of the tests specified in b) above must be taken into account.

7.2.3.4.2 Low dispersible material must be tested as follows:

A specimen that comprises or simulates low dispersible radioactive material must be subjected to the enhanced thermal test specified in 6;7.19.3 and the impact test specified in 6;7.19.4. A different specimen may be used for each of the tests. Following each test, the specimen must be subjected to the leach test specified in 7.2.3.1.4. After each test, it must be determined if the applicable requirements of 7.2.3.4.1 have been met.

7.2.3.4.3 Demonstration of compliance with the performance standards in 7.2.3.4.1 and 7.2.3.4.2 must be in accordance with 6;7.11.1 and 6;7.11.2.

UN Model Regulations, paragraph 2.7.2.3.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraphs 2.2.1.1 and 2.2.1.3 of this report

7.2.3.5 *Fissile material*

7.2.3.5.1 Fissile material and ~~P~~packages conta ining fissile material must be classified under the relevant entry as fissile in accordance with ~~of~~ Table 2-11~~, the description of which includes the words "FISSILE" or "fissile excepted". Classification as "fissile excepted" is allowed only if one of the conditions a) to d) of this paragraph is met. Only one type of exception is allowed per consignment (see also 6;7.6.2)~~ unless excepted by one of the provisions of sub-paragraphs a) to f) below and transported subject to the requirements of 7;2.9.4.3. All provisions apply only to material in packages that meets the requirements of 6;7.6.2.

~~a) A mass limit per consignment, provided that the smallest external dimension of each package is not less than 10 cm, such that:~~

$$\frac{\text{mass of uranium - 235(g)}}{X} + \frac{\text{mass of other fissile material (g)}}{Y} < 1$$

~~where X and Y are the mass limits defined in Table 2-14, provided that either:~~

~~i) each individual package contains not more than 15 g of fissile nuclides; for unpackaged material, this quantity limitation must apply to the consignment being carried in or on the conveyance;~~

~~ii) the fissile material is a homogeneous hydrogenous solution or mixture where the ratio of fissile nuclides to hydrogen is less than 5 per cent by mass; or~~

~~iii) there are not more than 5 g of fissile nuclides in any 10 L volume of material.~~

~~Beryllium must not be present in quantities exceeding 1 per cent of the applicable consignment mass limits provided in Table 2-14, except where the concentration of beryllium in the material does not exceed 1 gram beryllium in any 1 000 grams.~~

~~Deuterium must also not be present in quantities exceeding 1 per cent of the applicable consignment mass limits provided in Table 2-14, except where deuterium occurs up to natural concentration in hydrogen.~~

~~**Table 2-14. Consignment mass limits for exceptions from the requirements for packages containing fissile material**~~

~~*Fissile material*~~	~~*Fissile material mass (g) mixed with substances having an average hydrogen density less than or equal to water*~~	~~*Fissile material mass (g) mixed with substances having an average hydrogen density greater than water*~~
~~Uranium 235 (X)~~	~~400~~	~~290~~
~~Other fissile material (Y)~~	~~250~~	~~180~~

~~b~~a) Uranium enriched in uranium-235 to a maximum of 1 per cent by mass, and with a total plutonium and uranium-233 content not exceeding 1 per cent of the mass of uranium-235, provided that the fissile nuclides are distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it must not form a lattice arrangement;

~~c~~b) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2 per cent by mass, with a total plutonium and uranium-233 content not exceeding 0.002 per cent of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2;

~~d) Plutonium containing not more than 20 per cent of fissile nuclides by mass up to a maximum of 1 kg of plutonium per consignment. Shipments under this exception must be under exclusive use.~~

c) Uranium with a maximum uranium enrichment of 5 per cent by mass uranium-235 provided:

i) there is no more than 3.5 g of uranium-235 per package;

ii) the total plutonium and uranium-233 content does not exceed 1 per cent of the mass of uranium-235 per package;

iii) transport of the package is subject to the consignment limit provided in 7;2.9.4.3 c);

d) Fissile nuclides with a total mass not greater than 2 g per package provided the package is transported subject to the consignment limit provided in 7;2.9.4.3 d);

UN Model Regulations, paragraph 2.7.2.3.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraphs 2.2.1.1 and 2.2.1.3 of this report

e) Fissile nuclides with a total mass not greater than 45 g subject to limits provided in 7;2.9.4.3 e);

f) A fissile material that meets the requirements of 7;2.9.4.3 b), 7.2.3.6 and 5;1.2.2.1.

UN Model Regulations, paragraph 2.7.2.3.6, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.3.6 A fissile material excepted from classification as fissile under 7.2.3.5.1 f) must be subcritical without the need for accumulation control under the following conditions:

a) the conditions of 6;7.10.1 a);

b) the conditions consistent with the assessment provisions stated in 6;7.10.12 b) and 6;7.10.13 b) for packages; and

c) the conditions specified in 6;7.10.11 a).

7.2.4 Classification of packages

7.2.4.1 The quantity of radioactive material in a package must not exceed the relevant limits for the package type as specified below.

7.2.4.1.1 *Classification as excepted packages*

UN Model Regulations, paragraph 2.7.2.4.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.1.1.1 A ~~P~~package~~s~~ may be classified as excepted packages if it meets one of the following conditions:

a) ~~they are~~ it is an empty packaging~~s~~ having contained radioactive material;

b) ~~they~~ it contains instruments or articles ~~in limited quantities as~~ not exceeding the activity limits specified in columns 2 and 3 of Table ~~2-15~~ 2-14;

c) ~~they~~ it contains articles manufactured of natural uranium, depleted uranium or natural thorium; or

d) ~~they~~ it contains radioactive material ~~in limited quantities as~~ not exceeding the activity limits specified in column 4 of Table ~~2-15~~ 2-14; or

e) it contains less than 0.1 kg of uranium hexafluoride not exceeding the activity limits specified in column 4 of Table 2-14.

7.2.4.1.1.2 A package containing radioactive material may be classified as an excepted package provided that the radiation level at any point on its external surface does not exceed 5 μSv/h.

UN Model Regulations, paragraph 2.7.2.4.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.1.1.3 Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article may be classified under UN 2911 — **Radioactive material, excepted package — instruments** or **articles** ~~only if~~ provided that:

a) the radiation level at 10 cm from any point on the external surface of any unpackaged instrument or article is not greater than 0.1 mSv/h; and

b) each instrument or article bears the marking "RADIOACTIVE" ~~except~~ on its external surface except for the following:

i) radioluminescent time-pieces or devices;

ii) consumer products that either have received regulatory approval ~~according to~~ in accordance with 1;6.1.4 ~~b~~c) or do not individually exceed the activity limit for an exempt consignment in Table 2-12 (column 5), provided such products are transported in a package that bears the marking "RADIOACTIVE" on an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package; and

iii) other instruments or articles too small to bear the marking "RADIOACTIVE", provided that they are transported in a package that bears the marking "RADIOACTIVE" on its internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package;

c) the active material is completely enclosed by non-active components (a device performing the sole function of containing radioactive material must not be considered to be an instrument or manufactured article); and

d) the limits specified in columns 2 and 3 of Table ~~2-15~~ 2-14 are met for each individual item and each package, respectively.

UN Model Regulations, paragraph 2.7.2.4.1.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.1.1.4 Radioactive material in forms other than as specified in 7.2.4.1.1.3 and with an activity not exceeding the limits specified in column 4 of Table ~~2-15~~ 2-14 may be classified under UN 2910 — **Radioactive material, excepted package — limited quantity of material**, provided that:

a) the package retains its radioactive contents under routine conditions of transport; and

b) the package bears the marking "RADIOACTIVE" on either:

i) an internal surface in such a manner that a warning of the presence of radioactive material is visible on opening the package~~.~~; or

ii) the outside of the package, where it is impractical to mark an internal surface.

UN Model Regulations, new paragraph 2.7.2.4.1.5, ST/SG/AC.10/40/Add.1

7.2.4.1.1.5 Uranium hexafluoride not exceeding the limits specified in column 4 of Table 2-14 may be classified under UN 3507 — **Uranium hexafluoride, radioactive material, excepted package**, less than 0.1 kg per package, non-fissile or fissile-excepted provided that:

a) the mass of uranium hexafluoride in the package is less than 0.1 kg; and

b) the conditions of 7.2.4.5.2 and 7.2.4.1.1.4 a) and b) are met.

UN Model Regulations, paragraph 2.7.2.4.1.7, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

Move the following paragraph accordingly.

7.2.4.1.1 ~~5~~.7 An empty packaging which had previously contained radioactive material may be classified under UN 2908 — **Radioactive material, excepted package — empty packaging** ~~only if~~ provided that:

a) it is in a well-maintained condition and securely closed;

b) the outer surface of any uranium or thorium in its structure is covered with an inactive sheath made of metal or some other substantial material;

c) the level of internal non-fixed contamination, when averaged over any 300 cm^2, does not exceed:

(i) 400 Bq/cm2 for beta and gamma emitters and low toxicity alpha emitters; and

(ii) 40 Bq/cm2 for all other alpha emitters; and

d) any labels which may have been displayed on it in conformity with 5;3.2.6 are no longer visible.

DGP/24-WP/3 (paragraph 3.2.16) and DGP/24-WP/61 (paragraphs 2.2.1.1 and 2.2.5 of this report)

*Note.— The external radiation level at the surface of empty Type B(U) or Type B(M) packages may exceed 5 μSv/h due to the presence of depleted uranium in the shielding material. Such empty packages cannot be transported as UN 2908 — **Radioactive material, excepted package — empty packaging** as they do not meet the conditions specified in 7.2.4.1.1.2. These packages remain subject to all applicable parts of these Instructions and may be classified either as:*

a) low specific material (LSA-I) as specified in 7.2.3.1.2 a) ii);

b) Type B(U) package as specified in 7.2.4.6.2; or

c) Type B(M) package as specified in 7.2.4.6.3.

UN Model Regulations, paragraph 2.7.2.4.1.6, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.1.1.6 Articles manufactured of natural uranium, depleted uranium or natural thorium and articles in which the sole radioactive material is unirradiated natural uranium, unirradiated depleted uranium or unirradiated natural thorium may be classified under UN 2909, **Radioactive material, excepted package — articles manufactured from natural uranium** or **depleted uranium** or **natural thorium** ~~only if~~ provided that the outer surface of the uranium or thorium is enclosed in an inactive sheath made of metal or some other substantial material.

Table ~~2-15~~2-14. Activity limits for excepted packages

	Instruments or article		*Materials*
Physical state of contents	*Item limits**	*Package limits**	*Package limits**
Solids			
Special form	10^{-2} A_1	A_1	10^{-3} A_1
Other form	10^{-2} A_2	A_2	10^{-3} A_2
Liquids	10^{-3} A_2	10^{-1} A_2	10^{-4} A_2
Gases			
Tritium	2×10^{-2} A_2	2×10^{-1} A_2	2×10^{-2} A_2
Special form	10^{-3} A_1	10^{-2} A_1	10^{-3} A_1
Other forms	10^{-3} A_2	10^{-2} A_2	10^{-3} A_2

* For mixtures of radionuclides, see 7.2.2.4 to 7.2.2.6.

7.2.4.2 *Classification as low specific activity (LSA) material*

7.2.4.2.1 Radioactive material may only be classified as LSA material if the definition of LSA in 7.1.3 and the conditions of 7.2.3.1, 4;9.2.1 and 7;2.9.2 are met.

7.2.4.3 *Classification as surface contaminated object (SCO)*

7.2.4.3.1 Radioactive material may be classified as SCO if the definition of SCO in 7.1.3 and the conditions of 7.2.3.2, 4;9.2.1 and 7;2.9.2 are met.

7.2.4.4 *Classification of Type A packages*

7.2.4.4.1 Packages containing radioactive material may be classified as Type A packages provided that the following conditions are met:

UN Model Regulations, new paragraph 2.7.2.4.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.4.1.1 Type A packages must not contain activities greater than either of the following:

a) for special form radioactive material — A_1; ~~or~~

b) for all other radioactive material — A_2.

7.2.4.4.1.2 For mixtures of radionuclides whose identities and respective activities are known, the following condition must apply to the radioactive contents of a Type A package:

$$\sum_i \frac{B(i)}{A_1(i)} + \sum_j \frac{C(j)}{A_2(j)} \leq 1$$

where

B(i) is the activity of radionuclide i as special form radioactive material;

$A_1(i)$ is the A_1 value for radionuclide i;

C(j) is the activity of radionuclide j as other than special form radioactive material;

$A_2(j)$ is the A_2 value for radionuclide j.

UN Model Regulations, new paragraph 2.7.2.4.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.5 *Classification of uranium hexafluoride*

7.2.4.5.1 Uranium hexafluoride must only be assigned to:

a) UN 2977 — **Radioactive material, uranium hexafluoride, fissile**; ~~or~~

b) UN 2978 — **Radioactive material, uranium hexafluoride**, non-fissile or fissile excepted~~.~~; or

c) UN 3507 — **Uranium hexafluoride, radioactive material, excepted package**, less than 0.1 kg per package, non-fissile or fissile-excepted

UN Model Regulations, new paragraph 2.7.2.4.5.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.5.2 The contents of a ~~P~~package~~s~~ containing uranium hexafluoride must ~~not contain~~ comply with the following requirements:

a) for UN Nos. 2977 and 2978, ~~a~~ the mass of uranium hexafluoride must not be different from that ~~authorized~~ allowed for the package design, and for UN 3507, the mass of uranium hexafluoride must be less than 0.1 kg;

b) ~~a~~ the mass of uranium hexafluoride must not be greater than a value that would lead to an ullage smaller than 5 per cent at the maximum temperature of the package as specified for the plant systems where the package will be used; or

c) the uranium hexafluoride ~~other than~~ must be in solid form ~~or at an~~ and the internal pressure must not be above atmospheric pressure when presented for transport.

7.2.4.6 *Classification as Type B(U), Type B(M) or Type C packages*

UN Model Regulations, 2.7.2.4.6.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.6.1 Packages not otherwise classified in 7.2.4 (7.2.4.1.1 to 7.2.4.5) must be classified in accordance with the competent authority certificate of approval ~~certificate~~ for the package issued by the country of origin of design.

UN Model Regulations, 2.7.2.4.6.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.6.2 ~~A package may only be classified as a~~The contents of a Type B(U), Type B(M) or Type C package ~~if it does not contain:~~

~~a) activities greater than those authorized for the package design;~~

~~b) radionuclides different from those authorized for the package design; or~~

~~c) contents in a form or a physical or chemical state different from those authorized for the package design;~~

must be as specified in ~~their certificates~~ the certificate of approval.

UN Model Regulations, paragraphs 2.7.2.4.6.3 and 2.7.2.4.6.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and paragraph 2.2.1.1 of this report

7.2.4.6.3 (Deleted)~~A package may only be classified as a Type B(M) package if it does not contain:~~

~~a) activities greater than those authorized for the package design;~~

~~b) radionuclides different from those authorized for the package design; or~~

~~c) contents in a form or a physical or chemical state different from those authorized for the package design;~~

~~as specified in their certificates of approval.~~

7.2.4.6.4 (Deleted)~~A package may only be classified as a Type C package if it does not contain:~~

~~a) activities greater than those authorized for the package design;~~

~~b) radionuclides different from those authorized for the package design; or~~

~~c) contents in a form or physical or chemical state different from those authorized for the package design;~~

~~as specified in their certificates of approval.~~

7.2.5 Special arrangements

Radioactive material must be classified as transported under special arrangement when it is intended to be transported in accordance with 1;6.4.

Chapter 8

CLASS 8 — CORROSIVE SUBSTANCES

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Table ~~2-16~~2-15. Summary of criteria for assigning packing groups to corrosive substances

Packing group	*Exposure time*	*Observation period*	*Effect*
I	≤ 3 min	≤ 60 min	Full thickness destruction of intact skin
II	> 3 min ≤ 1 h	≤ 14 d	Full thickness destruction of intact skin
III	> 1 h ≤ 4 h	≤ 14 d	Full thickness destruction of intact skin
III	—	—	Corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55ºC when tested on both materials

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Chapter 9

CLASS 9 — MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES, INCLUDING ENVIRONMENTALLY HAZARDOUS SUBSTANCES

Parts of this Chapter are affected by State Variations DE 5, NL 4; see Table A-1

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9.2 ASSIGNMENT TO CLASS 9

9.2.1 Class 9 includes, inter alia:

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Some examples of articles in Class 9 are:

— Engines, internal combustion;

— Life-saving appliances, self-inflating;

— Battery-powered equipment or vehicle.

Some examples of substances in Class 9 are:

DGP/24-WP/3 (paragraph 3.2.13.1 d)) and paragraph 2.2.1.1 of this report

— ~~Blue, brown or white asbestos;~~ Asbestos, amphibole (amosite, tremolite, actinolite, anthophyllite, crocidolite)

— Asbestos, chrysotile

— Carbon dioxide, solid (dry ice);

— Zinc dithionite.

9.3 LITHIUM BATTERIES

9.3.1 Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form must be assigned to UN Nos. 3090, 3091, 3480 or 3481 as appropriate. They may be transported under these entries if they meet the following provisions:

a) each cell or battery is of the type proved to meet the requirements of each test of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;

UN Model Regulations, paragraph 2.9.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and DGP/24-WP/59 (paragraphs 2.2.1.1 and 5.1.12 and of this report

Note.— The following amendment will be incorporated in the 2013-2014 Edition of the Technical Instructions by way of a corrigendum.

Cells and batteries manufactured according to a type meeting the requirements of subsection 38.3 of the UN *Manual of Tests and Criteria*, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type testing may continue to be transported, unless otherwise provided in these Instructions.

Cell and battery types only meeting the requirements of the UN *Manual of Tests and Criteria*, Revision 3, are no longer valid. However, cells and batteries manufactured in conformity with such types before 1 July 2003 may continue to be transported if all other applicable requirements are fulfilled.

Note ~~1~~.— Batteries must be of a ~~design~~ type proved to meet the testing requirements of the UN Manual of Tests and Criteria*, Part III, subsection 38.3, irrespective of whether the cells of which they are composed are of a tested ~~design~~ type.*

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria, *Part III, subsection 38.3 may continue to be transported.*~~

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Part 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

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Chapter 2

ARRANGEMENT OF THE DANGEROUS GOODS LIST (TABLE 3-1)

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Table 3-1. Dangerous Goods List

See the appendices to this working paper for amendments to Table 3-1 (Appendix A = UN Number order and Appendix B = alphabetical order, proper shipper name)

Chapter 3

SPECIAL PROVISIONS

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Table 3-2. Special provisions

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DGP/24-WP/27 (paragraph 2.3.3 of this report)

A4 Liquids having a vapour inhalation toxicity of Packing Group I are forbidden on both passenger and cargo aircraft.

Liquids having a mist inhalation toxicity of Packing Group I are forbidden on a passenger aircraft. They may be carried on cargo aircraft providing they are packed in accordance with the packing instructions for the Packing Group I substance and the maximum net quantity per package does not exceed 5 L. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

A5 Solids having an inhalation toxicity of Packing Group I are forbidden on passenger aircraft. They may be carried on cargo aircraft providing they are packed in accordance with the packing instructions for the Packing Group I substance and the maximum net quantity per package does not exceed 15 kg. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

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UN Model Regulations, Chapter 3.3, SP 66 and 225, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

A18 (66) ~~Mercurous chloride and c~~Cinnabar ~~are~~ is not subject to these Instructions.

A19 (225) Fire extinguishers under this entry may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2 provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per extinguishing unit.

UN Model Regulations, Chapter 3.3, SP 225, ST/SG/AC.10/40/Add.1 and ST/SG/AC.10/C.3/86/Add.1
DGP/24-WP/3 (paragraph 3.2.17.1 f) and 3.2.29.1 a)) and paragraph 2.3.1.1 of this report

Fire extinguishers must be manufactured, tested, approved and labelled according to the provisions applied in the State of Manufacture. Fire extinguishers under this entry include:

a) portable fire extinguishers for manual handling and operation;

b) fire extinguishers for installation in aircraft;

c) fire extinguishers mounted on wheels for manual handling;

d) fire extinguishing equipment or machinery mounted on wheels or wheeled platforms or units transported similar to (small) trailers, and

e) fire extinguishers composed of a non-rollable pressure drum and equipment, and handled e.g. by fork lift or crane when loaded or unloaded.

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UN Model Regulations, Chapter 3.3, SP 135 and 138, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

A28 (135) The dihydrated sodium salt of dichloroisocyanuric acid does not meet the criteria for inclusion in Division 5.1 and is not subject to these Instructions unless meeting the criteria for inclusion in another class or division.

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UN Model Regulations, Chapter 3.3, SP 289, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

≠ A32 ~~Air bag inflators, air bag modules or seat belt pretensioners~~ Safety devices, electrically initiated and safety devices, pyrotechnic installed in vehicles, vessels or aircraft or in completed components such as steering columns, door panels, seats, etc., which are not capable of inadvertent activation are not subject to these Instructions when carried as cargo. The words “not restricted” and the special provision number A32 must be provided on the air waybill when an air waybill is issued.

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UN Model Regulations, Chapter 3.3, SP 251, ST/SG/AC.10/40/Add.1 (changes do not apply to Instructions)

≠ A44 The entry chemical kit or first-aid kit is intended to apply to boxes, cases, etc., containing small quantities of various dangerous goods which are used, for example, for medical, analytical or testing or repair purposes. Components must not react dangerously (see 4;1.1.8). The packing group assigned to the kit as a whole must be the most stringent packing group assigned to any individual substance in the kit. The assigned packing group must be shown on the dangerous goods transport document. Where the kit contains only dangerous goods to which no packing group is assigned, a packing group must not be indicated on the dangerous goods transport document.

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The only dangerous goods which are permitted in the kits are substances which may be transported as:

a) excepted quantities as specified in column 9 of Table 3-1, provided the inner packagings and quantities are as prescribed in 5.1.2 and 5.2.1 a); or

b) limited quantities under 3;4.1.2.

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UN Model Regulations, Chapter 3.3, SP 235, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

A56 This entry applies to articles which contain Class 1 explosive substances and which may also contain dangerous goods of other classes. These articles are used to enhance safety in vehicles, vessels or aircraft ~~as lifesaving vehicle~~ (e.g. air bag inflators ~~or~~, air bag modules ~~or~~, seat belt pretensioners and pyromechanical devices).

~~The quantities given in columns 11 and 13 of Table 3-1 refer to the net mass of the finished article.~~

Note.— For the carriage of a vehicle, see Packing Instruction 950, 951 and 952.

. . .

UN Model Regulations, Chapter 3.3, SP 306, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

A64 (306) This entry may only be used for substances that ~~do not exhibit explosive properties of~~ are too insensitive for acceptance into Class 1 when tested in accordance with test series ~~1 and~~ 2 ~~of Class 1~~ (see UN *Manual of Tests and Criteria*, Part I).

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DGP/24-WP/43 (paragraph 2.1.2 of this report)

A69 The following are not subject to these Instructions when carried as cargo:

a) articles other than lamps, such as thermometers, switches and relays, each containing a total quantity of not more than 15 g of mercury, if they are installed as an integral part of a machine or apparatus and so fitted that shock or impact damage, leading to leakage of mercury, is unlikely to occur under normal conditions of transport.

~~b) lamps, each containing not more than 1 g of mercury and packaged so that there is not more than 30 g of mercury per package. Packages must be so designed and constructed such that when subjected to drop tests from a height of not less than 0.5 m the packages must still be fit for transport and there must be no damage to the contents.~~

~~c~~b) articles other than lamps, each containing not more than 100 mg of mercury, gallium or inert gas and packaged so that the quantity of mercury, gallium or inert gas per package is 1 g or less.

The words “not restricted” and the special provision number A69 must be provided on the air waybill when an air waybill is issued.

Note.— For lamps containing dangerous goods, see Part 1;2.6.

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DGP/24-WP/28 and DGP/24-WP/34 (paragraphs 2.3.4 and 2.4.3.3 of this report)

A75 Articles such as sterilization devices, when containing less than 30 mL per inner packaging with not more than 150 mL per outer packaging, may be transported on passenger and cargo aircraft in accordance with the provisions in 3;5, irrespective of the ~~value in column 9 and the~~ indication of "forbidden" in columns 10 to 13 of ~~the Dangerous Goods List (~~Table 3-1~~)~~, provided such packagings were first subjected to comparative fire testing. Comparative fire testing between a package as prepared for transport (including the substance to be transported) and an identical package filled with water must show that the maximum temperature measured inside the packages during testing does not differ by more than 200°C. Packagings may include a vent to permit the slow escape of gas (i.e. not more than 0.1 mL/hour per 30 mL inner packaging at 20°C) produced from gradual decomposition.

The requirements of 4;1.1.6, 4;1.1.12 and 4;7.1.2 do not apply.

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UN Model Regulations, Chapter 3.3, SP 172, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

A78 (172) Where a ~~R~~radioactive material has ~~with~~ (a) subsidiary risk(s) ~~must~~:

Subparagraphs a) and b) below are reversed

~~a~~b) Packages must be labelled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material in accordance with the relevant provisions of 5;3.2; corresponding placards must be affixed to cargo transport units in accordance with the relevant provisions of 5;3.6;

~~b~~a) The substance must be allocated to Packing Group I, II or III, ~~as and~~ if appropriate, by application of the packing group~~ing~~ criteria provided in Part 2 corresponding to the nature of the predominant subsidiary risk. ~~For packing, see also 4;9.1.5.~~

c) For the purposes of documentation and package marking, the proper shipping name must be supplemented with the name of the constituents which most predominantly contribute to this (these) subsidiary risk(s) and which must be enclosed in parenthesis;

d) The dangerous goods transport document must indicate the subsidiary class or division and, where assigned, the packing group as required by 5;4.1.4.1 d) and e).

For packing, see also 4;9.1.5.

~~The description required in 5;4.1.5.7.1 b) must include a description of these subsidiary risks (e.g. "Subsidiary risk: 3,6.1"), the name of the constituents which most predominantly contribute to this (these) subsidiary risk(s) and, where applicable, the packing group.~~

Radioactive material with a subsidiary risk of Division 4.2 (Packing Group I) must be transported in Type B packages. Radioactive material with a subsidiary risk of Division 2.1 is forbidden from transport on passenger aircraft, and radioactive material with a subsidiary risk of Division 2.3 is forbidden from transport on passenger or cargo aircraft except with the prior approval of the appropriate authority of the State of Origin and the State of the Operator under the conditions established by those authorities. A copy of the document of approval, showing the quantity limitations and the packaging requirements, must accompany the consignment.

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UN Model Regulations, Chapter 3.3, SP 280, ST/SG/AC.10/40/Add.1and paragraph 2.3.1.1 of this report

≠ A115 (280) This entry applies to ~~articles which are used as lifesaving~~ safety devices for vehicles, vessels or aircraft, e.g. air bag inflators, ~~or~~ air bag modules ~~or~~, seat belt pretensioners, and pyromechanical devices and which contain dangerous goods of Class 1 or dangerous goods of other classes and when transported as component parts and ~~when~~ if these articles as presented for transport have been tested in accordance with test series 6 (c) of Part I of the UN *Manual of Tests and Criteria*, with no explosion of the device, no fragmentation of the device casing or pressure receptacle, and no projection hazard ~~and~~ nor thermal effect which would significantly hinder firefighting or other emergency response efforts in the immediate vicinity.

This entry does not apply to life saving appliances described in Packing Instruction 955 (UN Nos. 2990 and 3072).

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DGP/24-WP/45 (paragraph 2.3.5 of this report)

A123 This entry applies to Batteries, electric storage, not otherwise listed in Table 3-1. Examples of such batteries are: alkali-manganese, zinc-carbon~~, nickel-metal hydride~~ and nickel-cadmium batteries. Any electrical battery or battery-powered device, equipment or vehicle having the potential of a dangerous evolution of heat must be prepared for transport so as to prevent:

a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and

b) unintentional activation.

The words “not restricted” and the special provision number A123 must be provided on the air waybill when an air waybill is issued.

. . .

DGP/24-WP/28 (paragraph 2.3.4 of this report)

A131 (342) Glass inner receptacles (such as ampoules or capsules) intended only for use in sterilization devices, when containing less than 30 mL of ethylene oxide per inner packaging with not more than 300 mL per outer packaging, may be transported in accordance with the provisions in 3;5, irrespective of the indication of ~~“E0” in column 9~~ “forbidden” in columns 10 to 13 of Table 3-1, provided that:

a) after filling, each glass inner receptacle has been determined to be leak-tight by placing the glass inner receptacle in a hot water bath at a temperature, and for a period of time, sufficient to ensure that an internal pressure equal to the vapour pressure of ethylene oxide at 55°C is achieved. Any glass inner receptacle showing evidence of leakage, distortion or other defect under this test must not be transported under the terms of this special provision;

b) in addition to the packaging required by 3;5.2, each glass inner receptacle is placed in a sealed plastic bag compatible with ethylene oxide and capable of containing the contents in the event of breakage or leakage of the glass inner receptacle; and

c) each glass inner receptacle is protected by a means of preventing puncture of the plastic bag (e.g. sleeves or cushioning) in the event of damage to the packaging (e.g. by crushing).

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DGP/24-WP/3 (paragraph 3.2.28.2) and paragraph 2.3.1.1 of this report

A186 (361) This entry applies to electric double layer capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to these Instructions. Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. All capacitors to which this entry applies, including capacitors containing an electrolyte that does not meet the classification criteria of any class or division of dangerous goods, must meet the following conditions:

. . .

d) capacitors must be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting must be contained by the packaging or by the equipment in which a capacitor is installed; and

e) capacitors manufactured after 31 December 2013 must be marked with the energy storage capacity in Wh.

DGP/24-WP/3 (paragraph 3.2.19) and paragraph 2.3.1.1 of this report

A187 (362) This entry applies to liquids, pastes or powders, pressurized with a propellant which meets the definition of a gas in 2;2.1.1 and 2;2.1.2 a) or b).

Note.— A chemical under pressure in an aerosol dispenser must be transported under UN 1950.

The following provisions must apply:

a) The chemical under pressure must be classified based on the hazard characteristics of the components in the different states:

. . .

d) in addition, chemicals under pressure with components meeting the properties of: Class 1, explosives; Class 3, liquid desensitized explosives; Division 4.1, self-reactive substances and solid desensitized explosives; Division 4.2, substances liable to spontaneous combustion; Division 4.3, substances which, in contact with water, emit flammable gases; Division 5.1, oxidizing substances; Division 5.2, organic peroxides; Division 6.2, infectious substances; or Class 7, radioactive material, must not be used for transport under this proper shipping name.

e) Chemicals under pressure containing components forbidden for transport on both passenger and cargo aircraft (columns 10 to 13 of Table 3-1) must not be transported by air.

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UN Model Regulations, Chapter 3.3, SP 375, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.17.1 g)) and paragraph 2.3.1.1 of this report

A190 (373) Neutron radiation detectors containing non-pressurized boron trifluoride gas in excess of 1 gram and radiation detection systems containing neutron radiation detectors as components may be transported on cargo aircraft in accordance with all applicable requirements of these Instructions irrespective of the indication of "forbidden" in columns 12 and 13 of the Dangerous Goods List and with "Toxic gas" and "Corrosive" labels displayed on each package irrespective of no labels being indicated in column 5, provided the following conditions are met:

a) each radiation detector must meet the following conditions:

~~a~~i) the pressure in each neutron radiation detector must not exceed 105 kPa absolute at 20°C;

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~~b~~ii) the amount of gas must not exceed ~~12.8~~ 13 grams per detector ~~and the amount per outer packaging or per radiation detection system must not exceed 51.2 grams~~;

iii) each detector must be manufactured under a registered quality assurance programme;

Note.— The application of ISO 9001:2008 may be considered acceptable for this purpose.

~~c~~iv) each neutron radiation detector must be of welded metal construction with brazed metal to ceramic feed through assemblies. ~~They~~ These detectors must have a minimum burst pressure of 1 800 kPa as demonstrated by design type qualification testing; and

v) each detector must be tested to a 1 x 10^{-10} cm^3/s leaktightness standard before filling.

b) radiation detectors transported as individual components must be transported as follows:

~~d~~i) ~~each neutron radiation detector~~ theymust be packed in a sealed intermediate plastic liner with sufficient absorbent material to absorb the entire gas contents.

ii) ~~Neutron radiation detectors~~ they must be packed in strong outer packagings and the completed package must be ~~that are~~ capable of withstanding a 1.8 metre drop test without leakage of gas contents from detectors.

iii) the total amount of gas from all detectors per outer packaging must not exceed 52 grams.

c) completed neutron ~~R~~radiation detector systems containing ~~neutron radiation~~ detectors meeting the conditions of paragraph a) must be transported as follows:

i) the detectors must be contained in a strong sealed outer casing;

ii) the casing must contain ~~also include~~ sufficient absorbent material ~~sufficient~~ to absorb the entire gas contents ~~of the neutron radiation detectors. Absorbent material must be surrounded by a liner or liners, as appropriate.~~; and

iii) the completed system ~~They~~ must be packed in strong outer packagings capable of withstanding a 1.8 m drop test without leakage unless ~~neutron radiation detectors~~ a system's outer casing ~~are~~ afford~~ed~~s equivalent protection ~~by the radiation detection system; and~~.

~~e) the package must be labelled with "Toxic gas" and "Corrosive" subsidiary risk labels.~~

Transport in accordance with this special provision must be noted on the dangerous goods transport document. ~~and~~ A~~a~~ packing instruction must not be shown on the transport document.

When transported as cargo, neutron radiation detectors containing not more than 1 gram of boron trifluoride, including those with solder glass joints, ~~and radiation detection systems containing such detectors where the neutron radiation detectors meet and~~ are not subject to these Instructions provided they meet the requirements in paragraph a) and are packed in accordance with ~~the above conditions~~ paragraph b), ~~are not subject to these Instructions~~ irrespective of the indication of "forbidden" in columns 10 to 13. Radiation detection systems containing such detectors are not subject to these Instructions provided they are packed in accordance with paragraph c). The words "not restricted" and the special provision number A190 must be provided on the air waybill when an air waybill is used.

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UN Model Regulations, Chapter 3.3, SP 367, 368, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.17) and 2.3.1.1 of this report

A192 (367) For the purposes of documentation and package marking:

— the proper shipping name **Paint related material** may be used for consignments of packages containing paint and paint related material in the same package;

— the proper shipping name **Paint related material, corrosive, flammable** may be used for consignments of packages containing paint, corrosive, flammable and paint related material, corrosive, flammable in the same package;

— the proper shipping name **Paint related material, flammable, corrosive** may be used for consignments of packages containing paint, flammable, corrosive and paint related material, flammable, corrosive in the same package; and

— the proper shipping name **Printing ink related material** may be used for consignments of packages containing printing ink and printing ink related material in the same package.

A193 (368) In the case of non-fissile or fissile-excepted uranium hexafluoride, the material must be classified under UN 3507 or UN 2978.

UN Model Regulations, Chapter 3.3, 369, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (3.2.17.1 h)) and paragraph 2.3.1.1 of this report
Reference to 5;1.2.4.1 b) (requirement for identification of either shipper or consignee) was deleted following DGP-WG/13 since it would conflict with 5;2.4 (requirement for identification for both shipper and consignee).

A194 (369) In accordance with Part 2, Introductory Chapter, paragraph 4, this radioactive material in an excepted package possessing corrosive properties is classified in Class 8 with a radioactive material subsidiary risk.

Uranium hexafluoride may be classified under this entry only if the conditions of 2;7.2.4.1.1.2, 2;7.2.4.1.1.5, 2;7.2.4.5.2 and, for fissile-excepted material, of 2;7.2.3.6 are met.

In addition to the provisions applicable to the transport of Class 8 substances, the provisions of 5;1.2.2.2, 5;1.6.3, 7;1.6 and 7;3.2.1 to 7;3.2.4 apply.

No Class 7 label is required to be displayed.

UN Model Regulations, Chapter 3.3, 371, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.17.1 i)) and paragraph 2.3.1.1 of this report

A195 (371) 1. This entry also applies to articles, containing a small pressure receptacle with a release device. Such articles must comply with the following requirements:

a) the water capacity of the pressure receptacle must not exceed 0.5 litres and the working pressure must not exceed 25 bar at 15°C;

b) the minimum burst pressure of the pressure receptacle must be at least four times the pressure of the gas at 15 °C;

c) each article must be manufactured in such a way that unintentional firing or release is avoided under normal conditions of handling, packing, transport and use. This may be fulfilled by an additional locking device linked to the activator;

d) each article must be manufactured in such a way as to prevent hazardous projections of the pressure receptacle or parts of the pressure receptacle;

e) each pressure receptacle must be manufactured from material which will not fragment upon rupture;

f) the design type of the article must be subjected to a fire test. For this test, the provisions of paragraphs 16.6.1.2 except letter g, 16.6.1.3.1 to 16.6.1.3.6, 16.6.1.3.7 (b) and 16.6.1.3.8 of the UN *Manual of Tests and Criteria* must be applied. It must be demonstrated that the article relieves its pressure by means of a fire degradable seal or other pressure relief device, in such a way that the pressure receptacle will not fragment and that the article or fragments of the article do not rocket more than 10 metres; and

g) the design type of the article must be subjected to the following test. A stimulating mechanism must be used to initiate one article in the middle of the packaging. There must be no hazardous effects outside the package such as disruption of the package, metal fragments or a receptacle which passes through the packaging.

2. The manufacturer must produce technical documentation of the design type, manufacture as well as the tests and their results. The manufacturer must apply procedures to ensure that articles produced in series are made of good quality, conform to the design type and are able to meet the requirements in 1). The manufacturer must provide such information to the appropriate national authority on request.

UN Model Regulations, Chapter 3.3, 372, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.28.2) and paragraph 2.3.1.1 of this report

A196 (372) This entry applies to asymmetric capacitors with an energy storage capacity greater than 0.3 Wh. Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to these Instructions.

Energy storage capacity means the energy stored in a capacitor, as calculated according to the following equation:

$$Wh = 1/2C_N(U_R^2-U_L^2) \times (1/3600),$$

using the nominal capacitance (C_N), rated voltage (U_R) and rated lower limit voltage (U_L).

All asymmetric capacitors to which this entry applies must meet the following conditions:

a) capacitors or modules must be protected against short circuit;

b) capacitors must be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting must be contained by packaging or by equipment in which a capacitor is installed;

c) capacitors manufactured after 31 December 2015 must be marked with the energy storage capacity in Wh; and

d) capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods must be designed to withstand a 95 kPa pressure differential;

Capacitors containing an electrolyte not meeting the classification criteria of any class or division of dangerous goods, including when configured in a module or when installed in equipment are not subject to other provisions of these Instructions.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, with an energy storage capacity of 20 Wh or less, including when configured in a module, are not subject to other provisions of these Instructions when the capacitors are capable of withstanding a 1.2 metre drop test unpackaged on an unyielding surface without loss of contents.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods that are not installed in equipment and with an energy storage capacity of more than 20 Wh are subject to these Instructions.

Capacitors installed in equipment and containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, are not subject to other provisions of these Instructions provided that the equipment is packaged in a strong outer packaging constructed of suitable material, and of adequate strength and design, in relation to the packaging's intended use and in such a manner as to prevent accidental functioning of capacitors during transport. Large robust equipment containing capacitors may be offered for transport unpackaged or on pallets when capacitors are afforded equivalent protection by the equipment in which they are contained.

*Note.— Notwithstanding the provisions of this special provision, nickel-carbon asymmetric capacitors containing Class 8 alkaline electrolytes must be transported as UN 2795, B**atteries, wet, filled with alkali**, electric storage.*

UN Model Regulations, Chapter 3.3, 375, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.17) and paragraph 2.3.1.1 of this report

A197 (375) These substances when transported in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Instructions provided the packagings meet the general provisions of 4;1.1.1, 4;1.1.3.1 and 4;1.1.5.

DGP/24-WP/45 (paragraph 2.3.5 of this report)

A198 Hay, straw and bhusa, when not wet, damp or contaminated with oil are not subject to these Instructions.

A199 Nickel-metal hydride batteries or nickel-metal hydride battery-powered devices, equipment or vehicles having the potential of a dangerous evolution of heat are not subject to these Instructions provided they are prepared for transport so as to prevent:

a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and

b) unintentional activation.

The words “not restricted” and the special provision number A199 must be provided on the air waybill when an air waybill is issued.

UN Model Regulations, Dangerous goods list, SP374, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.17.1 e)) and paragraphs 2.3.5 and 3.1.4 of this report

A200 This entry applies to packagings that contain residues of dangerous goods and which no longer meet the provisions of Part 6. These packagings are forbidden for transport by air. Such packagings or parts thereof must be transported in accordance with Part 4;1.1.15 of these Instructions.

———————

Chapter 4

DANGEROUS GOODS IN LIMITED QUANTITIES

. . .

4.1 APPLICABILITY

4.1.1 Limited quantities of dangerous goods may only be carried in accordance with the limitations and provisions of this chapter and must meet all the applicable requirements of the Technical Instructions unless otherwise provided for below.

4.1.2 Only dangerous goods which are permitted on passenger aircraft and which meet the criteria of the following classes, divisions and packing groups (if appropriate) may be carried under these provisions for dangerous goods in limited quantities:

DGP/24-WP/2 (paragraph 3.2.11) and paragraph 2.3.1.1 of this report

Class 2	Only UN 1950 in Divisions 2.1 and 2.2, UN 2037 in Divisions 2.1 and 2.2 without a subsidiary risk, UN 3478 (**Fuel cell cartridges**, containing liquefied flammable gas) and UN 3479 (**Fuel cell cartridges**, containing hydrogen in metal hydride)
Class 3	Packing Groups II and III and UN 3473 (**Fuel cell cartridges**, containing flammable liquids)
Division 4.1	Packing Groups II and III but excluding all self-reactive substances irrespective of packing group
Division 4.3	Packing Groups II and III, solids only and UN 3476 (**Fuel cell cartridges**, containing water-reactive substances)
Division 5.1	Packing Groups II and III
Division 5.2	Only when contained in a chemical kit or a first-aid kit
Division 6.1	Packing Groups II and III
Class 8	Packing Groups II and III and UN 3477 (**Fuel cell cartridges**, containing corrosive substances) but excluding UN 2794, UN 2795, UN 2803, UN 2809, UN 3028 and UN 3506.
Class 9	Only UN 1941, UN 1990, UN 2071, UN 3077, UN 3082, UN 3316, UN 3334, ~~and~~ UN 3335 and ID 8000

Note.— Many articles or substances, including the following, are NOT permitted under these limited quantity provisions:

a) those permitted only on cargo aircraft;

b) those in Packing Group I;

c) those in Class 1 or 7 or Divisions 2.1 (~~other than aerosols~~except as permitted above), 2.3 or 6.2;

d) those in Division 4.2 or with a subsidiary risk 4.2.

4.1.3 The limitations and provisions of this chapter for the transport of dangerous goods in limited quantities apply equally to both passenger and cargo aircraft.

. . .

4.5 PACKAGE MARKING

4.5.1 Packages containing limited quantities of dangerous goods must be marked as required by the applicable paragraphs of 5;2, except that 5;2.4.4.1 does not apply.

UN Model Regulations, paragraph 3.4.8, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.3.1.1 of this report

Text from Figure 3-1 has been moved to 4.5.2.

4.5.2 Packages containing limited quantities of dangerous goods and prepared in accordance with this chapter must bear the marking shown in Figure 3-1 below. The marking must be readily visible, legible and able to withstand open weather exposure without a substantial reduction in effectiveness. The marking must be in the form of a square set at an angle of 45°(diamond shaped). The top and bottom portions and the surrounding line must be black. The centre area must be white or a suitable contrasting background. The minimum dimension must be 100 mm × 100 mm and the minimum width of the line forming the diamond must be 2 mm. The symbol "Y" must be placed in the centre of the mark and must be clearly visible. Where dimensions are not specified, all features must be in approximate proportion to those shown.

4.5.2.1 If the size of the package so requires, the minimum outer dimensions shown in Figure 3-1 may be reduced to be not less than 50 mm × 50 mm provided the marking remains clearly visible. The minimum width of the line forming the diamond may be reduced to a minimum of 1 mm. The symbol "Y" must remain in approximate proportion to that shown in Figure 3-1.

4.5.3 When packages containing dangerous goods in limited quantities are placed in an overpack, the overpack must be marked with the word "OVERPACK" and the marking required by this chapter, unless the markings representative of all dangerous goods in the overpack are visible.

Replace Figure 3-1 with the following (text which was below the limited quantity mark is moved to 4.5.2):

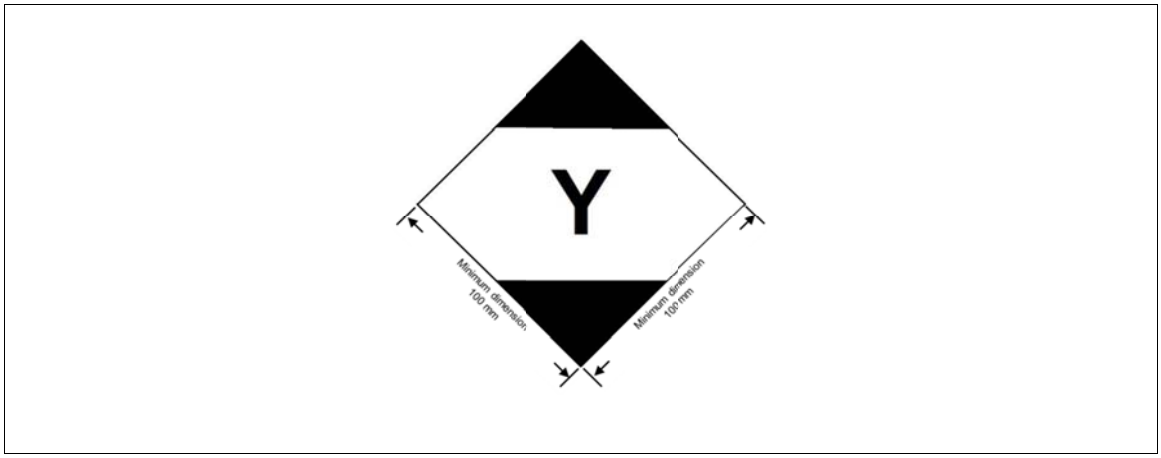


Figure 3-1. Limited quantities mark

Chapter 5

DANGEROUS GOODS PACKED IN EXCEPTED QUANTITIES

Parts of this Chapter are affected by State Variation JP 23; see Table A-1

5.1 EXCEPTED QUANTITIES

5.1.1 Excepted quantities of dangerous goods of certain classes, other than articles, meeting the provisions of this chapter are not subject to any other provisions of these Instructions except for:

a) the prohibition in post in 1;2.3;

b) the definitions in 1;3;

c) the training requirements in 1;4;

d) the classification procedures and packing group criteria in Part 2;

DGP/24-WP/2 (paragraph 3.2.15) and paragraph 2.3.1.1 of this report

e) the packaging requirements of 4;1.1.1, 4;1.1.3.1, 4;1.1.3.3, 4;1.1.5, 4;1.1.6, 4;1.1.7 and 4;1.1.8 (4;1.1.6 does not apply to UN 3082);

f) the loading restriction in 7;2.1;

g) the reporting requirements of dangerous goods accidents, incidents and other occurrences in 7;4.4 and 7;4.5; and

h) the prohibition of dangerous goods in baggage in 8;1.1.

Note.— In the case of radioactive material, the requirements for radioactive material in excepted packages in 1;6.1.5 apply.

. . .

5.4 MARKING OF PACKAGES

5.4.1 Packages containing excepted quantities of dangerous goods prepared in accordance with this chapter must be durably and legibly marked with the mark shown in Figure 3-2. The primary hazard class or, when assigned, the division of each of the dangerous goods contained in the package must be shown in the mark. Where the name of the shipper or consignee is not shown elsewhere on the package, this information must be included within the mark.

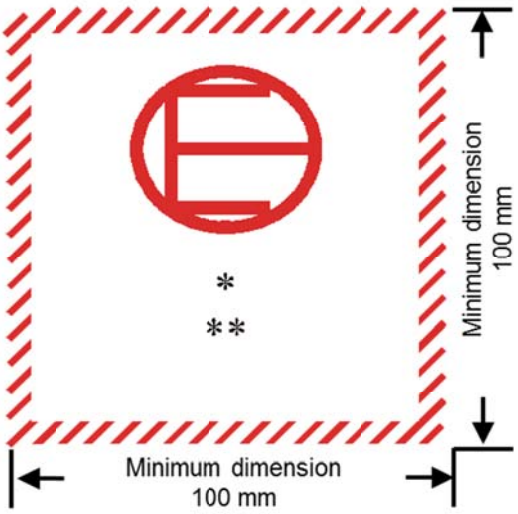
UN Model Regulations, paragraph 3.5.4.2, ST/SG/AC.10/40/Add.1 and paragraph 2.3.1.1 of this report

Text from Figure 3-2 has been moved to 5.4.2.

5.4.2 The marking must be in the form of a square. The hatching and symbol must be of the same colour, black or red, on white or suitable contrasting background. The dimensions of the mark must be a minimum of 100 mm × 100 mm. Where dimensions are not specified, all features must be in approximate proportion to those shown.

5.4.3 An overpack containing dangerous goods in excepted quantities must display the markings required by 5.4.1, unless such markings on packages within the overpack are clearly visible.

Replace Figure 3-2 with the following (text which is below the limited quantity mark in the 2013-2014 Edition of the Technical; Instructions (on left hand side) is moved to 5.4.2):



* Place for class or, when assigned, the division number(s)
** Place for name of shipper or consignee, if not shown elsewhere on the package

Figure 3-2. Excepted quantities mark

. . .

Part 4

PACKING INSTRUCTIONS

. . .

Chapter 1

GENERAL PACKING REQUIREMENTS

. . .

1.1 GENERAL REQUIREMENTS APPLICABLE TO ALL CLASSES EXCEPT CLASS 7

. . .

DGP/24-WP/36 (paragraph 2.4.5 of this report)

1.1.2 New, remanufactured, reused or reconditioned packagings which are listed in Tables 6-2 and 6-3, must meet the applicable requirements of Part 6 of these Instructions. Such packagings must be manufactured and tested under a quality assurance programme which satisfies the appropriate national authority, in order to ensure that such packagings meet those applicable requirements. Where packagings are required to be tested in accordance with 6;4, their subsequent use must be as specified in the applicable test report and conform in all respects with the design type which was tested, including the method of packing and size and type of any inner packagings, except as provided for in 1.1.10.1 ~~and~~ or 6;4.1.7. Before being filled and handed over for transport, every packaging must be inspected to ensure that it is free from corrosion, contamination or other damage. Any packaging which shows signs of reduced strength as compared with the approved design type must no longer be used or must be so reconditioned that it is able to withstand the design type tests.

. . .

1.1.10 Inner packagings must be so packed, secured or cushioned in an outer packaging in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the outer packaging. Inner packagings containing liquids must be packaged with their closures upward and placed within outer packagings consistent with the orientation markings prescribed in 5;3.2.12 b) of these Instructions. Inner packagings that are liable to break or be punctured easily, such as those made of glass, porcelain or stoneware or of certain plastic material, must be secured in outer packagings with suitable cushioning material. Any leakage of the contents must not substantially impair the protective properties of the cushioning material or of the outer packaging.

1.1.10.1 Where an outer packaging of a combination packaging has been successfully tested with different types of inner packagings, a variety of such different inner packagings may also be assembled in this outer packaging ~~or large packaging~~. In addition, provided an equivalent level of performance is maintained, the following variations in inner packagings are allowed without further testing of the package:

a) inner packagings of equivalent or smaller size may be used provided:

   1) the inner packagings are of similar design to the tested inner packagings (e.g. shape — round, rectangular);

   2) the material of construction of the inner packagings (glass, plastics, metal, etc.) offers resistance to impact and stacking forces equal to or greater than that of the originally tested inner packaging;

   3) the inner packagings have the same or smaller openings and the closure is of similar design (screw cap, friction lid, etc.);

   4) sufficient additional cushioning material is used to take up void spaces and to prevent significant movement of the inner packagings; and

   5) inner packagings are oriented within the outer packaging in the same manner as in the tested package; and

b) a lesser number of the tested inner packagings, or of the alternative types of inner packagings identified in a) above, may be used provided sufficient cushioning is added to fill the void space(s) and to prevent significant movement of the inner packagings.

UN Model Regulations, 4.1.1.5.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.4.1.1 of this report

1.1.10.2 Use of supplementary packagings within an outer packaging (e.g. an intermediate packaging or a receptacle inside a required inner packaging) additional to what is required by the packing instructions is permitted provided all relevant requirements are met, including those of 4;1.1.2, and, if appropriate, suitable cushioning is used to prevent movement within the packaging.

Chapter 3

CLASS 1 — EXPLOSIVES

. . .

UN Model Regulations, P131, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.4.1.1 of this report

Packing Instruction 131

Inner packagings	*Intermediate packagings*	*Outer packagings*
Bags paper plastics Receptacles fibreboard metal plastics wood Reels	Not necessary	Boxes aluminium (4B) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with siftproof walls (4C2) other metal (4N) plastics, solid (4H2) plywood (4D) reconstituted wood (4F) steel (4A) Drums ≠ aluminium (1B1, 1B2) fibre (1G) ≠ plastics (1H1, 1H2) + other metal (1N1, 1N2) plywood (1D) ≠ steel (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— For UN 0029, 0267 and 0455, bags and reels must not be used as inner packagings.

. . .

UN Model Regulations, P137, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.4.1.1 of this report

Packing Instruction 137

Inner packagings	*Intermediate packagings*	*Outer packagings*
Bags plastics Boxes fibreboard wood Tubes fibreboard metal plastics Dividing partitions in the outer packagings	Not necessary	Boxes aluminium (4B) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with siftproof walls (4C2) other metal (4N) plastics, solid (4H2) plywood (4D) reconstituted wood (4F) steel (4A)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— For UN 0059, 0439, 0440 and 0441, when the shaped charges are packed singly, the conical cavity must face downwards and the package marked “THIS SIDE UP”. When the shaped charges are packed in pairs, the conical cavities must face inwards to minimize the jetting effect in the event of accidental initiation.

Chapter 4

CLASS 2 — GASES

. . .

4.1 SPECIAL PACKING PROVISIONS FOR DANGEROUS GOODS OF CLASS 2

4.1.1 General requirements

4.1.1.1 This section provides general requirements applicable to the use of cylinders and closed cryogenic receptacles for the transport of Class 2 gases (e.g. UN 1072 **Oxygen, compressed**). Cylinders and closed cryogenic receptacles must be constructed and closed so as to prevent any loss of contents which might be caused under normal conditions of transport, including by vibration, or by changes in temperature, humidity or pressure (resulting from change in altitude, for example).

UN Model Regulations, paragraph 4.1.6.1.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.4.1.1 of this report

4.1.1.2 Parts of cylinders and closed cryogenic receptacles that are in direct contact with dangerous goods must not be affected or weakened by those dangerous goods and must not cause a dangerous effect (e.g. catalysing a reaction or reacting with the dangerous goods). In addition to the requirements specified in the relevant packing instruction, which take precedence, the applicable provisions of ISO 11114-1:~~1997~~2012 and ISO 11114-2:2000 must be met.

DGP/24-WP/80 (paragraph 2.4.10 of this report)

Packing Instruction 203

Passenger and cargo aircraft for UN 1950 and 2037 only

~~This Instruction applies to UN 1950 and 2037.~~

The general packing requirements of 4;1 must be met.

~~Single packagings are not permitted.~~For the purposes of this packing instruction, a receptacle is considered to be an inner packaging.

Note.— "Receptacle" has the same meaning as set out in 1;3. Any reference in this packing instruction to receptacle will include "aerosols" of UN1950 and "receptacles, small, containing gas" and "gas cartridges" of UN 2037. For the purpose of this packing instruction, the receptacle is considered to be an inner packaging.

Metal aerosols (IP.7, IP.7A, IP.7B) and non-refillable receptacles containing gas (gas cartridges)

Non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) must not exceed 1 000 mL capacity.

The following conditions must be met:

a) the pressure in the receptacle must not exceed 1 500 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;

b) if the pressure in the receptacle exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an IP.7, IP.7A or IP.7B metal receptacle must be used;

c) if the pressure in the receptacle exceeds 1 105 kPa at 55°C but does not exceed 1 245 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;

d) if the pressure in the receptacle exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;

e) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in a), b), c) or d) do not apply to the pressure within the capsule for an aerosol. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into the outer metal receptacle;

f) the liquid content must not completely fill the closed receptacle at 55°C;

g) each receptacle exceeding 120 mL capacity must have been heated until the pressure in the receptacle is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect.

Plastic aerosols (IP.7C)

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 accordance with the provisions of the Technical Instructions, in which case the quantity must not exceed 500 mL.

The following conditions must be met:

a) the contents must not completely fill the closed receptacle at 55°C;

b) the pressure in the ~~container~~ receptacle may not exceed 970 kPa at 55°C; and

c) each receptacle must be leak tested in accordance with the provisions of 6;3.2.8.1.6.

~~***All aerosols***~~

~~a) the valves, if fitted, must be protected by a cap or other suitable means during transport;~~

~~b) receptacles must be tightly packed, so as to prevent movement in wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F), fibreboard boxes (4G) or plastic boxes (4H1, 4H2) of Packing Group II.~~

ADDITIONAL PACKING REQUIREMENTS

— Packagings must meet Packing Group II performance requirements.
— Release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents during normal conditions of air transport.
— Receptacles must be tightly packed, so as to prevent movement.

OUTER PACKAGINGS (see 6;3.1)

Boxes	*Drums*
Aluminium (4B)	Aluminium (1B2)
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Other metal (1N2)
Other metal (4N)	Plastics (1H2)
Plastics (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

Packing Instruction Y203

Passenger and cargo aircraft for UN 1950 and 2037 only

~~This Instruction applies to UN 1950 and 2037.~~

The requirements of 3;4 must be met.

~~Single packagings are not permitted.~~For the purposes of this packing instruction, a receptacle is considered to be an inner packaging.

Note.— "Receptacle" has the same meaning as set out in 1;3. Any reference in this packing instruction to receptacle will include "aerosols" of UN1950 and "receptacles, small, containing gas" and "gas cartridges" of UN 2037. For the purpose of this packing instruction the receptacle is considered to be an inner packaging.

COMBINATION PACKAGINGS:

INNER:

Metal aerosols (IP.7, IP.7A, IP.7B) and non-refillable receptacles containing gas (gas cartridges)

Non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) containing toxic substances must not exceed 120 mL capacity.

All other non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) must not exceed 1 000 mL capacity.

The following conditions must be met:

a) the pressure in the receptacle must not exceed 1 245 kPa at 55°C and each receptacle must be capable of withstanding without bursting a pressure of at least 1.5 times the equilibrium pressure of the contents at 55°C;

b) if the pressure in the receptacle exceeds 970 kPa at 55°C but does not exceed 1 105 kPa at 55°C, an IP.7, IP.7A or IP.7B metal receptacle must be used;

c) if the pressure in the receptacle exceeds 1 105 kPa at 55°C, an IP.7A or IP.7B metal receptacle must be used;

d) if the pressure in the receptacle exceeds 1 245 kPa at 55°C, an IP.7B metal receptacle must be used;

e) IP.7B metal receptacles having a minimum burst pressure of 1 800 kPa may be equipped with an inner capsule charged with a non-flammable, non-toxic compressed gas to provide the propellant function. In this case, the pressures indicated in a), b), c) or d) do not apply to the pressure within the capsule for an aerosol. The quantity of gas contained in the capsule must be so limited such that the minimum burst pressure of the receptacle would not be exceeded if the entire gas content of the capsule were released into the outer metal receptacle;

f) the liquid content must not completely fill the closed receptacle at 55°C;

g) each receptacle exceeding 120 mL capacity must have been heated until the pressure in the receptacle is equivalent to the equilibrium pressure of the contents at 55°C, without evidence of leakage, distortion or other defect.

Plastic aerosols *(IP.7C)*

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 accordance with the provisions of the Technical Instructions, in which case the quantity must not exceed 500 mL.

The following conditions must be met:

a) the contents must not completely fill the closed receptacle at 55°C;

b) the pressure in the ~~container~~ receptacle may not exceed 970 kPa at 55°C; and

c) each receptacle must be leak tested in accordance with the provisions of 6;3.2.8.1.6.

~~***All aerosols***~~

~~a) the valves, if fitted, must be protected by a cap or other suitable means during transport;~~

~~b) receptacles must be tightly packed, so as to prevent movement.~~

~~*OUTER:*~~

~~Boxes~~
~~Fibreboard~~
~~Plastics~~
~~Plywood~~
~~Reconstituted wood~~
~~Wooden~~

ADDITIONAL PACKING REQUIREMENTS

— Release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents during normal conditions of air transport.
— Receptacles must be tightly packed, so as to prevent movement.

OUTER PACKAGINGS (see 6;3.1)

Boxes	*Drums*
Aluminium	Aluminium
Fibreboard	Fibre
Natural wood	Other metal
Other metal	Plastics
Plastics	Plywood
Plywood	Steel
Reconstituted wood	
Steel	

. . .

UN Model Regulations, P003, PP91 for UN 1044, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29.1 a)) and paragraph 2.4.1.1 of this report

Packing Instruction 213

The general packing requirements of 4;1 must be met.

Fire extinguishers with compressed or liquefied gas must be packed in strong outer packagings so that they cannot be accidentally activated.

Fire extinguishers may include installed actuating cartridges (cartridges, power device of Division 1.4C or 1.4S), without changing the classification of Division 2.2, provided the total quantity of deflagrating (propellant) explosives does not exceed 3.2 g per extinguishing unit.

Large fire extinguishers may also be transported unpackaged provided that the requirements of S-4;3.1.2 a) to e) are met, the valves are protected by one of the methods in accordance with 4;4.1.1.8 a) to c) and other equipment mounted on the fire extinguisher is protected to prevent accidental activation. For the purpose of this packing instruction, "large fire extinguishers" means fire extinguishers as described in sub-paragraphs c) to e) of Special Provision A19.

DGP/24-WP/2 (paragraph 3.2.19) and paragraph 2.4.1.1 of this report
Note.— This amendment was approved and published by decision of the Council of ICAO in Addendum No. 3 to the 2013-2014 Edition of the Technical Instructions.

Packing Instruction 216

Passenger and cargo aircraft for UN 3478 and 3479 (contained in equipment) only

. . .

ADDITIONAL PACKING REQUIREMENTS

— Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
— Equipment must be securely cushioned in the outer packagings.
— Fuel cell systems must not charge batteries during transport.
— On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, or a standard approved by the appropriate authority of the State of Origin.

. . .

. . .

UN Model Regulations, P208, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraphs 3.2.29.1 b) and c)) and paragraph 2.4.1.3 of this report

Packing Instruction 219

For cylinders, the general packing requirements of 4;1.1 and 4;4.1.1 must be met.

This Instruction applies to Class 2 adsorbed gases.

1) The following packagings are permitted provided the general packing requirements of 4.1.1 are met:

   Cylinders specified in 6;5 and in accordance with ISO 11513:2011 or ISO 9809-1:2010.

2) The pressure of each filled cylinder must be less than 101.3 kPa at 20°C and less than 300 kPa at 50°C.

3) The minimum test pressure of the cylinder is 21 bar.

4) The minimum burst pressure of the cylinder is 94.5 bar.

5) The internal pressure at 65°C of the filled cylinder must not exceed the test pressure of the cylinder.

6) The adsorbent material must be compatible with the cylinder and must not form harmful or dangerous compounds with the gas to be adsorbed. The gas in combination with the adsorbent material must not affect or weaken the cylinder or cause a dangerous reaction (e.g. a catalyzing reaction).

7) The quality of the adsorbent material must be verified at the time of each fill to assure the pressure and chemical stability requirements of this packing instruction are met each time an adsorbed gas package is offered for transport.

8) The adsorbent material must not meet the criteria of any of the classes or divisions in these Instructions.

9) The filling procedure must be in accordance with Annex A of ISO 11513:2011.

10) The maximum period for periodic inspections is five years.

11) The construction materials of the cylinders and their accessories must be compatible with the contents and must not react to form harmful or dangerous compounds therewith.

. . .

Chapter 5

CLASS 3 — FLAMMABLE LIQUIDS

. . .

DGP/24-WP/2 (paragraph 3.2.19) and paragraph 2.4.1.1 of this report
Note.— This amendment was approved and published by decision of the Council of ICAO in Addendum No. 3 to the 2013-2014 Edition of the Technical Instructions.

Packing Instruction 375

Passenger and cargo aircraft for UN 3473 (contained in equipment) only

. . .

ADDITIONAL PACKING REQUIREMENTS

— Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
— Equipment must be securely cushioned in the outer packagings.
— Fuel cell systems must not charge batteries during transport.
— On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, or a standard approved by the appropriate authority of the State of Origin.

. . .

. . .

Chapter 6

CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

DGP/24-WP/44 (paragraph 2.4.6 of this report)

. . .

Packing Instruction 457

Passenger and cargo aircraft for UN 3241 only

. . .

COMBINATION PACKAGINGS					**SINGLE PACKAGINGS**	
UN number and proper shipping name	*Inner packaging (see 6;3.2)*	*Inner packaging quantity (per receptacle)*	*Total quantity per package — passenger*	*Total quantity per package — cargo*	*Passenger*	*Cargo*
UN 3241 **2-Bromo-2-nitropropane-1,3-diol**	Glass	0.5 kg	25 kg	50 kg	25 kg	50 kg
	Plastics	1.0 kg				
	Plastic bag	1.0 kg				

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

— Packagings must meet the Packing Group II performance requirements.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

~~Aluminium (4B)~~
Fibreboard (4G)
Natural wood (4C1, 4C2)
~~Other metal (4N)~~
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
~~Steel (4A)~~

Drums

~~Aluminium (1B1, 1B2)~~
Fibre (1G)

Plastics (1H1, 1H2)
Plywood (1D)
~~Steel (1A1, 1A2)~~

Jerricans

~~Aluminium (3B1, 3B2~~)
Plastics (3H1, 3H2)
~~Steel (3A1, 3A2)~~

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

— Packagings must meet the Packing Group II performance requirements.

SINGLE PACKAGINGS

Composites	*Drums*	*Jerricans*
~~All (see 6;3.1.18)~~ Plastic receptacle with outer wooden box (6HC) Plastic receptacle with outer plywood drum (6HD1) Plastic receptacle with outer plywood box (6HD2) Plastic receptacle with outer fibre drum (6HG1) Plastic receptacle with outer fibreboard box (6HG2) Plastic receptacle with outer plastic drum (6HH1)	~~Aluminium (1B1, 1B2)~~ ~~Other metal (1N1, 1N2)~~ Plastics (1H1, 1H2) ~~Steel (1A1, 1A2)~~	~~Aluminium (3B1, 3B2)~~ Plastics (3H1, 3H2) ~~Steel (3A1, 3A2)~~

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DGP/24-WP/2 (paragraph 3.2.18) and paragraph 2.4.1.1 of this report

Packing Instruction 473

Passenger and cargo aircraft for UN 1378 and UN 2881 only

General requirements

Part 4, Chapter 1 requirements must be met, including:

. . .

1) Compatibility requirements

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) Closure requirements

— Closures must meet the requirements of 4;1.1.4.

SINGLE PACKAGINGS FOR PACKING GROUP III ONLY

Cylinders	*Drums*	*Jerricans*
See 4;2.7	Steel (1A1, 1A2)	Steel (3A1, 3A2)

. . .

DGP/24-WP/2 (paragraph 3.2.19) and paragraph 2.4.1.1 of this report

Note.— This amendment was approved and published by decision of the Council of ICAO in Addendum No. 3 to the 2013-2014 Edition of the Technical Instructions.

Packing Instruction 496

Passenger and cargo aircraft for UN 3476 (contained in equipment) only

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ADDITIONAL PACKING REQUIREMENTS

— Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
— Equipment must be securely cushioned in the outer packagings.
— The mass of each fuel cell cartridge must not exceed 1 kg.
— Fuel cell systems must not charge batteries during transport.
— On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, or a standard approved by the appropriate authority of the State of Origin.

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Chapter 7

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

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Packing Instruction 570

Passenger and cargo aircraft

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DGP/24-WP/34 (paragraph 2.4.3 of this report)

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

— Packagings must meet the Packing Group II performance requirements.

Cargo aircraft only

When used for purposes such as sterilization, inner packagings of peroxyacetic acid, stabilized, classified as UN 3107 **Organic peroxide type E, liquid** or UN 3109 **Organic peroxide type F, liquid** may be fitted with a vent consisting of hydrophobic membrane, provided:

a) each inner packaging contains not more than 70 mL;

b) the inner packaging is designed so that the vent is not immersed in liquid in any orientation;

c) each inner packaging is enclosed in an intermediate rigid plastic packaging with a small opening to permit release of gas and contains a buffer that neutralizes the contents of the inner packaging in the event of leakage;

d) intermediate packagings are packed in a fibreboard box (4G) outer packaging;

e) each outer packaging contains not more than 1.4 L of liquid; and

f) the rate of oxygen release from the outer packaging does not exceed 15 mL per hour.

Such packages must be transported on cargo aircraft only. The requirements of 4;1.1.6, 4;1.1.12 and 4;7.1.2 do not apply.

DGP/24-WP/3 (paragraphs 3.2.30) and paragraph 2.4.1.1 of this report

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes		*Drums*		*Jerricans*
Fibreboard (4G)		Fibre (1G)	≠	Plastics (3H1, 3H2)
Natural wood (4C1, 4C2)	≠	Plastics (1H1, 1H2)		
~~Other metal (4N)~~		Plywood (1D)		
Plastics (4H1, 4H2)				
Plywood (4D)				
Reconstituted wood (4F)				

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Chapter 8

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

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Packing Instruction 650

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4) For transport, the mark illustrated below must be displayed on the external surface of the outer packaging on a background of a contrasting colour and must be clearly visible and legible. The mark must be in the form of a square set at an angle of 45° (diamond-shaped) with each side having a length of at least 50 mm, the width of the line must be at least 2 mm, and the letters and numbers must be at least 6 mm high. The proper shipping name “Biological substance, Category B” in letters at least 6 mm high must be marked on the outer packaging adjacent to the diamond-shaped mark.

UN Model Regulations, P650, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29.1 d)) and paragraph 2.4.1.1 of this report

Replace mark for Biological substance, Category B with the following:



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Chapter 9

CLASS 7 — RADIOACTIVE MATERIAL

Parts of this Chapter are affected by State Variations CA 1, CA 2, CA 4, IR 4, JP 2, JP 17; see Table A-1

9.1 GENERAL

9.1.1 Radioactive material, packagings and packages must meet the requirements of 6;7. The quantity of radioactive material in a package must not exceed the limits specified in 2;7.2.4. The types of packages for radioactive materials covered by these Instructions are:

a) Excepted package (see 1;6.1.5);

b) Industrial package Type 1 (Type IP-1 package);

c) Industrial package Type 2 (Type IP-2 package);

d) Industrial package Type 3 (Type IP-3 package);

e) Type A package;

f) Type B(U) package;

g) Type B(M) package;

h) Type C package.

Packages containing fissile material or uranium hexafluoride are subject to additional requirements.

9.1.2 The non-fixed contamination on the external surfaces of any package must be kept as low as practicable and, under routine conditions of transport, must not exceed the following limits:

a) 4 Bq/cm2 for beta and gamma emitters and low toxicity alpha emitters; and

b) 0.4 Bq/cm2 for all other alpha emitters.

These limits are applicable when averaged over any area of 300 cm^2 of any part of the surface.

UN Model Regulations, paragraph 4.1.9.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.4.1.1 of this report

9.1.3 A package~~, other than an excepted package,~~ must not contain any other items except such articles and documents as are necessary for the use of the radioactive material. This requirement must not preclude the transport of low specific activity material or surface contaminated objects with other items. The transport of such articles and documents in a package, or of low specific activity material or surface contaminated objects with other items may be permitted provided that there is no interaction between them and the packaging or its radioactive contents that would reduce the safety of the package.

9.1.4 Except as provided in 7;3.2.5, the level of non-fixed contamination on the external and internal surfaces of overpacks and freight containers, must not exceed the limits specified in 9.1.2.

9.1.5 Radioactive material meeting the criteria of other Classes or Divisions as defined in Part 2 must be allocated to Packing Group I, II or III, as appropriate, by the application of the grouping criteria provided in Part 2 corresponding to the nature of the predominant subsidiary risk. It must also be capable of meeting the appropriate packaging performance criteria for the subsidiary risk.

UN Model Regulations, paragraphs 4.1.9.1.6 to 4.1.9.1.11, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29 (paragraph 3.2.29 e) for 9.1.7 below)) and paragraph 2.4.1.1 of this report

9.1.6 ~~Before the first shipment of any package, the following requirements must be fulfilled~~ Before a packaging is first used to transport radioactive material, it must be confirmed that it has been manufactured in conformity with the design

specifications to ensure compliance with the relevant provisions of these Instructions and any applicable certificate of approval. The following requirements must also be fulfilled, if applicable:

a) If the design pressure of the containment system exceeds 35 kPa (gauge), it must be ensured that the containment system of each packageing conforms to the approved design requirements relating to the capability of that system to maintain its integrity under that pressure;

b) For each packaging intended for use as a Type B(U), Type B(M) and Type C package and for each packageing intended to containing fissile material, it must be ensured that the effectiveness of its shielding and containment and, where necessary, the heat transfer characteristics and the effectiveness of the confinement system, are within the limits applicable to or specified for the approved design;

c) For each packageing intended to containing fissile material, it must be ensured that the effectiveness of the criticality safety features is within the limits applicable to or specified for the design and in particular where, in order to comply with the requirements of 6;7.10.1 neutron poisons are specifically included ~~as components of the package~~, checks must be performed to confirm the presence and distribution of those neutron poisons.

9.1.7 Before each shipment of any package, it must be ensured that the package does not contain:

a) radionuclides different from those specified for the package design; or

b) contents in a form, or physical or chemical state different from those specified for the package design.

9.1.~~7~~8 Before each shipment of any package, it must be ensured that all the requirements specified in the relevant provisions of these Instructions and in the applicable certificates of approval have been fulfilled. ~~t~~The following requirements must also be fulfilled, if applicable:

~~a) For any package it must be ensured that all the requirements specified in the relevant provisions of these Instructions have been satisfied;~~

~~b~~a) It must be ensured that lifting attachments which do not meet the requirements of 6;7.1.2 have been removed or otherwise rendered incapable of being used for lifting the package, in accordance with 6;7.1.3;

~~c) For each package requiring competent authority approval, it must be ensured that all the requirements specified in the approval certificates have been satisfied;~~

~~d~~b) Each Type B(U), Type B(M) and Type C package must be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;

~~e~~c) For each Type B(U), Type B(M) and Type C package, it must be ensured by inspection and/or appropriate tests that all closures, valves, and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of 6;~~7.7.7~~7.7.8 and 6;7.9.3 were made;

~~f) For each special form radioactive material, it must be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Instructions have been satisfied;~~

~~g~~d) For packages containing fissile material, the measurement specified in 6;7.10.~~4~~5 b) and the tests to demonstrate closure of each package as specified in 6;7.10.~~7~~8 must be performed ~~where applicable~~;

~~h) For each low dispersible radioactive material, it must be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Instructions have been satisfied.~~

9.1.~~8~~.9 The shipper must also have a copy of any instructions with regard to the proper closing of the package and any preparation for shipment before making any shipment under the terms of the certificates.

9.1.~~9~~.10 Except for consignments under exclusive use, the transport index of any package or overpack must not exceed 10, nor must the criticality safety index of any package or overpack exceed 50.

9.1.~~10~~.11 Except for packages or overpacks transported under exclusive use and special arrangement under the conditions specified in 7;2.10.5.3, the maximum radiation level at any point on any external surface of a package or overpack must not exceed 2 mSv/h.

9.1.~~11~~.12 The maximum radiation level at any point on any external surface of a package or overpack under exclusive use must not exceed 10 mSv/h.

9.2 REQUIREMENTS AND CONTROLS FOR TRANSPORT OF LSA MATERIAL AND SCO

UN Model Regulations, paragraph 4.1.9.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29) and paragraph 2.4.1.1 of this report

9.2.1 The quantity of LSA material or SCO in a single Industrial package Type 1 (Type IP-1), Industrial package Type 2 (Type IP-2), or Industrial package Type 3 (Type IP-3), must be so restricted that the external radiation level at 3 m from the unshielded material does not exceed 10 mSv/h.

9.2.2 LSA material and SCO which ~~is~~ are or contain~~s~~ fissile material, which is not excepted under 2;7.2.3.5, must meet the applicable requirements in 7;2.10.4.1~~,~~ and 7;2.10.4.2 ~~and 6;7.10.1~~.

9.2.3 LSA material and SCO which are or contain fissile material must meet the applicable requirements of 6;7.10.1.

9.2.~~3~~4 LSA-I material ~~and~~, SCO-I ~~in groups LSA-I and SCO-I~~ and fissile material must not be transported unpackaged.

9.2.~~4~~5 LSA material and SCO must be packaged in accordance with Table 4-2.

9.3 PACKAGES CONTAINING FISSILE MATERIAL

~~Unless not classified as fissile in accordance with 2;7.2.3.5,~~ The contents of packages containing fissile material must ~~not contain:~~

~~a) a mass of fissile material (or mass of each fissile nuclide for mixtures when appropriate) different from that authorized for the package design;~~

~~b) any radionuclide or fissile material different from those authorized for the package design; or~~
~~c) contents in a form or physical or chemical state, or in a spatial arrangement, different from those authorized for the package design;~~

be as specified for the package design either directly in these Instructions or in the~~ir~~ certificate~~s~~ of approval~~, where appropriate~~.

Table 4-2. Industrial package requirements for LSA material and SCO

	Industrial package type	
Radioactive contents	*Exclusive use*	*Not under exclusive use*
LSA-I Solid Liquid	 Type IP-1 Type IP-1	 Type IP-1 Type IP-2
LSA-II Solid Liquid and gas	 Type IP-2 Type IP-2	 Type IP-2 Type IP-3
LSA-III	Type IP-2	Type IP-3
SCO-I	Type IP-1	Type IP-1
SCO-II	Type IP-2	Type IP-2

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Chapter 10

CLASS 8 — CORROSIVE SUBSTANCES

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DGP/24-WP/2 (paragraph 3.2.19) and paragraph 2.4.1.1 of this report
Note.— This amendment was approved and published by decision of the Council of ICAO in Addendum No. 3 to the 2013-2014 Edition of the Technical Instructions.

Packing Instruction 874

Passenger and cargo aircraft for UN 3477 (contained in equipment) only

. . .

ADDITIONAL PACKING REQUIREMENTS

— Fuel cell cartridges that are contained in equipment must be protected against short circuit and the equipment must be protected against inadvertent operation.
— Equipment must be securely cushioned in the outer packagings.
— The mass of each fuel cell cartridge must not exceed 1 kg.
— Fuel cell systems must not charge batteries during transport.
— On passenger aircraft, each fuel cell system and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, or a standard approved by the appropriate authority of the State of Origin.

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. . .

UN Model Regulations, P805, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29.1 f)) and paragraph 2.4.1.5 of this report

Packing Instruction 877

Passenger and cargo aircraft for UN 3507 only

General requirements

Part 4, Chapter 1 and Part 4;9.1.2, 9.1.4 and 9.1.7 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.
— Metal packagings must be corrosion resistant or be protected against corrosion.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

	Quantity per package	
UN number and name	*Passenger*	*Cargo*
UN 3507 **Uranium hexafluoride, radioactive material, excepted package,** non-fissile or fissile-excepted	Less than 0.1 kg	Less than 0.1 kg

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

— Substances must be packed in a metal or plastics primary receptacle in a leakproof rigid secondary packaging in a rigid outer packaging.
— Primary inner receptacles must be packed in secondary packagings in a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings must be secured in outer packagings with suitable cushioning material to prevent movement. If multiple primary receptacles are placed in a single secondary packaging, they must be either individually wrapped or separated so as to prevent contact between them;
— The contents must comply with the provisions of 2;7.2.4.5.2.
— The provisions of 6;7.3 must be met.
— In the case of fissile-excepted material, limits specified in 2;7.2.3.5 and 6;7.10.2

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Plastics (4H1, 4H2)	Plastics (1H2)	
Plywood (4D)	Plywood (1D)	
Reconstituted wood (4F)	Steel (1A2)	
Steel (4A)		

DGP/24-WP/2 (paragraph 3.5.2) and paragraph 2.4.1.1 of this report

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Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

Parts of this Chapter are affected by State Variation US 2; see Table A-1

Packing Instruction 950

Passenger and cargo aircraft for UN 3166 only
(See Packing Instruction 951 for flammable gas-powered vehicles and engines or
Packing Instruction 952 for battery-powered equipment and vehicles)

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ADDITIONAL PACKING REQUIREMENTS

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Batteries

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;

2) if lithium batteries are installed, they must ~~be of a type that has successfully passed the tests specified in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3~~ meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin, must be securely fastened in the vehicle, machinery or equipment and must be protected in such a manner so as to prevent damage and short circuits; and

3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

DGP/24-WP/70 (paragraph 2.4.9)

Other operational equipment

1) Dangerous goods required for the operation or safety of the vehicle, machine or equipment, such as fire extinguishers, tire inflation canisters~~,~~ or safety devices, must be securely mounted in the vehicle, machine or equipment. Aircraft may also contain other articles and substances which would otherwise be classified as dangerous goods but which are installed in that aircraft in accordance with the pertinent airworthiness requirements and operating regulations. If fitted, life-rafts, emergency escape slides and other inflation devices must be protected such that they cannot be activated accidentally. Vehicles containing dangerous goods identified in Table 3-1 as forbidden on passenger aircraft may only be transported on cargo aircraft. Replacements for the dangerous goods permitted must not be carried under this packing instruction.

. . .

DGP/24-WP/2 (paragraph 3.5.2) and paragraph 2.4.1.1 of this report

Packing Instruction 951

Cargo aircraft only for UN 3166 only
(See Packing Instruction 950 for flammable liquid-powered vehicles and engines or
Packing Instruction 952 for battery-powered equipment and vehicles)

. . .

ADDITIONAL PACKING REQUIREMENTS

. . .

Batteries

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;

2) if lithium batteries are installed, they must ~~be of a type that has successfully passed the tests specified in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3~~ meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin, must be securely fastened in the vehicle, machinery or equipment and must be protected in such a manner so as to prevent damage and short circuits; and

3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

DGP/24-WP/70 (paragraph 2.4.9)

Other operational equipment

1) Dangerous goods required for the operation or safety of the vehicle, machine or equipment, such as fire extinguishers, tire inflation canisters~~,~~ or safety devices, must be securely mounted in the vehicle, machine or equipment. Aircraft may also contain other articles and substances which would otherwise be classified as dangerous goods but which are installed in that aircraft in accordance with the pertinent airworthiness requirements and operating regulations. If fitted, life-rafts, emergency escape slides and other inflation devices must be protected such that they cannot be activated accidentally. Vehicles containing dangerous goods identified in Table 3-1 as forbidden on passenger aircraft may only be transported on cargo aircraft. Replacements for the dangerous goods permitted must not be carried under this packing instruction.

. . .

DGP/24-WP/2 (paragraph 3.5.2) and paragraph 2.4.1.1 of this report

Packing Instruction 952

Passenger and cargo aircraft for UN 3171 only
(See Packing Instruction 950 for flammable liquid-powered vehicles and engines or
Packing Instruction 951 for flammable gas-powered vehicles and engines)

. . .

Batteries

All batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. In addition:

1) if spillable batteries are installed, and it is possible for the vehicle, machine or equipment to be handled in such a way that batteries would not remain in their intended orientation, they must be removed and packed according to Packing Instruction 492 or 870 as applicable;

2) if lithium batteries are installed in a vehicle, they must ~~be of a type that has successfully passed the tests specified in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3~~ meet the provisions of Part 2;9.3, unless otherwise approved by the appropriate authority of the State of Origin, must be securely fastened in the vehicle~~, machinery or equipment~~ and must be protected in such a manner so as to prevent damage and short circuits; and

3) if sodium batteries are installed they must conform to the requirements of Special Provision A94.

DGP/24-WP/70 (paragraph 2.4.9)

Other operational equipment

1) Dangerous goods required for the operation or safety of the vehicle, machine or equipment, such as fire extinguishers, tire inflation canisters~~, and~~ or safety devices, must be securely mounted in the vehicle, machine or equipment. Aircraft may also contain other articles and substances which would otherwise be classified as dangerous goods but which are installed in that aircraft in accordance with the pertinent airworthiness requirements and operating regulations. If fitted, life-rafts, emergency escape slides and other inflation devices must be protected such that they cannot be activated accidentally. Vehicles containing dangerous goods identified in Table 3-1 as forbidden on passenger aircraft may only be transported on cargo aircraft. Replacements for the dangerous goods permitted must not be carried under this packing instruction.

2) Vehicles equipped with theft-protection devices, installed radio communications equipment or navigational systems must have such devices, equipment or systems disabled.

. . .

DGP/24-WP/4, paragraph 2.4.2 of this report

Packing Instruction 955

Passenger and cargo aircraft for UN 2990 and UN 3072 only

The term "life-saving appliances" applies to articles such as life rafts, life vests, aircraft survival kits or aircraft evacuation slides.

The description "Life-saving appliances, self-inflating" (UN 2990) is intended to apply to life-saving appliances that present a hazard if the self-inflating device is activated accidentally.

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

UN number and proper shipping name	*Quantity — passenger*	*Quantity — cargo*
UN 2990 **Life-saving appliances, self-inflating** UN 3072 **Life-saving appliances, not self-inflating** containing dangerous goods as equipment	No limit	No limit

ADDITIONAL PACKING REQUIREMENTS

~~The description "Life-saving appliances, self-inflating" (UN 2990) is intended to apply to life-saving appliances that present a hazard if the self-inflating device is activated accidentally.~~

Life-saving appliances~~, such as life rafts, life vests, aircraft survival kits or aircraft evacuation slides,~~ may only contain the dangerous goods listed below:

a) Division 2.2 gases, must be contained in cylinders which conform to the requirements of the appropriate national authority of the country in which they are approved and filled. Such cylinders may be connected to the life-saving appliance. These cylinders may include installed actuating cartridges (cartridges, power device of Division 1.4C and 1.4S) provided the aggregate quantity of deflagrating (propellant) explosives does not exceed 3.2 grams per unit. When the cylinders are shipped separately, they must be classified as appropriate for the Division 2.2 gas contained and need not be marked, labelled or described as explosive articles;

b) signal devices (Class 1), which may include smoke and illumination signal flares; signal devices must be packed in plastic or fibreboard inner packagings;

c) small quantities of flammable substances, corrosive solids and organic peroxides (Class 3, Class 8, Division 4.1 and 5.2), which may include a repair kit and not more than 30 strike-anywhere matches. The organic peroxide may only be a component of a repair kit and the kit must be packed in strong inner packaging. The strike-anywhere matches must be packed in a cylindrical metal or composition packaging with a screw-type closure and be cushioned to prevent movement;

d) electric storage batteries (Class 8), which must be disconnected or electrically isolated and protected against short circuits; ~~and lithium batteries (Class 9); and~~

e) lithium batteries:

1) must meet the applicable requirements of 2;9.3;

2) must be disconnected or electrically isolated and protected against short circuits; and

3) must be secured against movement within the appliance.

~~e~~f) first aid kits which may include flammable, corrosive and toxic articles or substances.

The appliances must be packed, so that they cannot be accidentally activated, in strong outer packagings and, except for life vests, the dangerous goods must be in inner packagings packed so as to prevent movement. The dangerous goods must be an integral part of the appliance without which it would not be operational and in quantities which do not exceed those appropriate for the actual appliance when in use.

~~Passenger restraint systems consisting of a cylinder charged with a non-liquefied, non-flammable compressed gas and no more than two actuating cartridges per passenger restraint system that meet the requirements of the State of Manufacture must be packed in strong outer packagings so they cannot be accidentally activated.~~

Life-saving appliances packed in strong rigid outer packagings with a total maximum gross mass of 40 kg, containing no dangerous goods other than Division 2.2 compressed or liquefied gases with no subsidiary risk in receptacles with a capacity not exceeding 120 mL, installed solely for the purpose of the activation of the appliance, are not subject to these Instructions when carried as cargo.

Life-saving appliances may also include articles and substances not subject to these Instructions which are an integral part of the appliance.

DGP/24-WP/3 (paragraph 3.2.13.1 d)) and paragraph 2.4.1.1 of this report

Packing Instruction 958

Passenger and cargo aircraft for UN 2071 and UN 2590 only

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

UN number and proper shipping name	*Quantity — passenger*	*Quantity — cargo*	**SINGLE PACKAGINGS**
UN 2071 **Ammonium nitrate fertilizers** UN 2590 **~~White a~~Asbestos, chrysotile**	200 kg	200 kg	Yes

. . .

Packing Instruction 959

Passenger and cargo aircraft for UN 3245 only

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The following packagings are authorized:

. . .

2) Packagings, which need not conform to the packaging test requirements of Part 6, but conforming to the following:

. . .

For transport, the mark illustrated below must be displayed on the external surface of the outer packaging on a background of a contrasting colour and must be clearly visible and legible. The mark must be in the form of a square set at an angle of 45° (diamond-shaped) with each side having a length of at least 50 mm; the width of the line must be at least 2 mm and the letters and numbers must be at least 6 mm high.

UN Model Regulations, P904, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.29.1 d)) and paragraph 2.4.1.1 of this report

Replace mark for GMO/GMMOs with the following:



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. . .

DGP/24-WP/54 (paragraph 2.4.8 of this report)

Packing Instruction 962

Passenger and cargo aircraft for UN 3363 only

General requirements

Part 4, Chapter 1 requirements must be met (except that the requirements of 4;1.1.2, 1.1.9, 1.1.13 and 1.1.16 do not apply), including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

This entry only applies to apparatus or machinery containing dangerous goods as a residue or as an integral element of the machinery or apparatus. It must not be used for apparatus or machinery for which a proper shipping name exists in Table 3-1. For other than fuel system components, apparatus or machinery may only contain one or more of the following: dangerous goods permitted under 3;4.1.2 or UN 2807 or gases of Division 2.2 without subsidiary risk but excluding refrigerated liquefied gases.

UN number and proper shipping name	*State*	*Total net quantity of dangerous goods in one package (excluding magnetic material)*
UN 3363 **Dangerous goods in apparatus** or **Dangerous goods in machinery**	Liquid	0.5 L
	Solid	1 kg
	Gas (Division 2.2 only)	0.5 kg

ADDITIONAL PACKING REQUIREMENTS

— Receptacles containing dangerous goods must be so secured or cushioned so as to prevent their breakage or leakage and so as to control their movement within the machinery or apparatus during normal conditions of transport. Cushioning material must not react dangerously with the contents of the receptacles. Any leakage of the contents must not substantially impair the protective properties of the cushioning material.
— "Package orientation" labels (Figure 5-26), or preprinted orientation labels meeting the same specification as either Figure 5-26 or ISO Standard 780-1997 must be affixed on at least two opposite vertical sides with the arrows pointing in the correct direction only when required to ensure liquid dangerous goods remain in their intended orientation.
— Irrespective of 5;3.2.10, machinery or apparatus containing magnetized material meeting the requirements of Packing Instruction 953 must also bear the "Magnetized material" label (Figure 5-24).
— For Division 2.2 gases, cylinders for gases, their contents and filling ratios must conform to the requirements of Packing Instruction 200.
— Dangerous goods in apparatus or machinery must be packed in strong outer packagings unless the receptacles containing the dangerous goods are afforded adequate protection by the construction of the apparatus or machinery.

Fuel system components

— Fuel system components must be emptied of fuel as far as practicable and all openings must be sealed securely. They must be packed:

1) in sufficient absorbent material to absorb the maximum amount of liquid which may possibly remain after emptying. Where the outer packaging is not liquid tight, a means of containing the liquid in the event of leakage must be provided in the form of a leakproof liner, plastic bag or other equally efficient means of containment; and

2) in strong outer packagings.

~~**OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)**~~

~~Dangerous goods in apparatus or machinery must be packed in strong outer packagings unless the receptacles containing the dangerous goods are afforded adequate protection by the construction of the apparatus or machinery.~~

DGP/24-WP/2 (paragraph 3.2.20) and paragraph 2.4.1.1 of this report

Packing Instruction Y963

Passenger and cargo aircraft for ID 8000 only

Consumer commodities are materials that are packaged and distributed in a form intended or suitable for retail sale for the purposes of personal care or household use. These include items administered or sold to patients by doctors or medical administrations. Except as otherwise provided below, dangerous goods packed in accordance with this packing instruction do not need to comply with 4;1 or Part 6 of these Instructions; they must, however, comply with all other applicable requirements.

a) Each packaging must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during air transport.

b) Inner packagings that are breakable (such as earthenware, glass or brittle plastic) must be packed to prevent breakage and leakage under conditions normally incident to transport. ~~These completed packagings~~ Each package offered for transport must be capable of withstanding a 1.2 m drop on solid concrete in the position most likely to cause damage. The criteria for passing the test is that the outer packaging must not exhibit any damage liable to affect safety during transport and there must be no leakage from the inner packaging(s). Each package offered for transport must be capable of withstanding, without breakage or leakage of any inner packaging and without significant reduction of effectiveness, a force applied to the top surface for a duration of 24 hours equivalent to the total weight of identical packages if stacked to a height of 3 m (including the test sample).

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DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

Packing Instruction 965

Passenger and cargo aircraft for UN 3480

1. **Introduction**

This entry applies to lithium ion or lithium polymer batteries. This packing instruction is structured as follows:

— Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
— Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and
— Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. **SECTION IA**

~~Section IA requirements apply to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh that have been determined to meet the criteria for assignment to Class 9~~.

Each cell or battery must meet all the provisions of 2;9.3.~~:~~

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

1A.1 **General requirements**

Part 4;1 requirements must be met.

Packing Instruction 965

Table 965-IA

UN number and proper shipping name	*Net quantity per package*	
	Passenger	*Cargo*
UN 3480 **Lithium ion batteries**	5 kg	35 kg

IA.2 **Additional requirements**

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.
- Lithium ion batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

IA.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

IB. **SECTION IB**

~~Section IB requirements apply to lithium ion cells with a Watt hour rating not exceeding 20 Wh and lithium ion batteries with a Watt hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II.~~

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II ~~must be assigned to Class 9 and~~ are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for ~~the following:~~ the provisions of Part 6.

Lithium ion cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number “965” required by 5;4.1.5.8.1 a) must be supplemented with “IB”. All other applicable provisions of Part 5;4 apply.

~~— the provisions of Part 6; and~~
~~— the dangerous goods transport document requirements of 5;4, provided alternative written documentation is provided by the shipper describing the contents of the consignment. Where an agreement exists with the operator, the shipper may provide the information by electronic data processing (EDP) or electronic data interchange (EDI) techniques. The information required is as follows and should be shown in the following order:~~

~~1) the name and address of the shipper and consignee;~~
~~2) UN 3480;~~
~~3) Lithium ion batteries PI 965 IB;~~

Packing Instruction 965

DGP/24-WP/3 (paragraph 3.5.4) DGP/24-WP/55 and paragraphs 2.4.1.1 and 5.1.10 of this report

~~4) the number of packages and the gross mass of each package.~~

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   — the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. — Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. — Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported;*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

IB.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

DGP/24-WP/3 (paragraph 3.5.4) and paragraph 2.4.1.1 of this report

Table 965-IB

Contents	*Net quantity per ~~P~~package ~~quantity~~*	
	Passenger	*Cargo*
Lithium ion cells and batteries	10 kg~~G~~	10 kg~~G~~

IB.2 **Additional requirements**

— Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
— Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
— Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  — damage to cells or batteries contained therein;
  — shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  — release of contents.
— Each package must be labelled with a lithium battery handling label (Figure 5-31) in addition to the Class 9 hazard label.
— Each consignment must be accompanied with a document with an indication that:
  — the package contains lithium ion cells or batteries;
  — the package must be handled with care and that a flammability hazard exists if the package is damaged;
  — special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  — a telephone number for additional information.

Packing Instruction 965

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Note.— This information may be provided on the dangerous goods transport document.

IB.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium ion cells and batteries offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   — the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 965-II

Contents	*Lithium ion cells and/or batteries with a Watt-hour rating not more than 2.7 Wh*	*Lithium ion cells with a Watt-hour rating more than 2.7 Wh, but not more than 20 Wh*	*Lithium ion batteries with a Watt-hour rating more than 2.7 Wh, but not more than 100 Wh*
1	*2*	*3*	*4*
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

Packing Instruction 965

II.2 **Additional requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- Where a consignment includes packages bearing the lithium battery handling label, the words “lithium ion batteries, in compliance with Section II of PI965” must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 966

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

1. **Introduction**

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3.~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Part 4;1 requirements must be met.

	Package quantity (Section I)	
UN number and proper shipping name	*Passenger*	*Cargo*
UN 3481 **Lithium ion batteries packed with equipment**	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

Packing Instruction 966

I.2 **Additional requirements**

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- For the purpose of this packing instruction, “equipment” means apparatus requiring the lithium ion batteries with which it is packed for its operation.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium ion cells and batteries packed with equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and ~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009;.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria, *Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

Packing Instruction 966

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 **Additional requirements**

- Lithium ion cells and batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/24-WP/64 (paragraph 5.1.14 of this report)

- The ~~maximum~~ number of cells or batteries in each package must ~~be~~ not exceed the ~~minimum~~appropriate number ~~required to power~~ for the equipment's operation, plus two spares.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- The words "lithium ion batteries, in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

Boxes *Drums* *Jerricans*

Strong outer packagings

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

Packing Instruction 967

Passenger and cargo aircraft for UN 3481 (contained in equipment) only

1. **Introduction**

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

UN number and proper shipping name		*Package quantity (Section I)*	
		Passenger	*Cargo*
UN 3481	**Lithium ion batteries contained in equipment**	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

I.2 **Additional requirements**

— The equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport.
— The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
— Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

Packing Instruction 967

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium ion cells and batteries contained in equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   — the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

DGP/24-WP/58 (paragraph 5.1.11)

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 **General requirements**

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 **Additional requirements**

— The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
— Cells and batteries must be protected so as to prevent short circuits.
— The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.

Packing Instruction 967

- Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 5-31) (except button cell batteries installed in equipment (including circuit boards)).
- Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- Where a consignment includes packages bearing the lithium battery handling label, the words “lithium ion batteries, in compliance with Section II of PI967” must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 968

Passenger and cargo aircraft for UN 3090

1. **Introduction**

This entry applies to lithium metal or lithium alloy batteries. This packing instruction is structured as follows:

— Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
— Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II; and
— Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table 968-II.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

IA. **SECTION IA**

~~Section IA requirements apply to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g that have been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3.~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN Manual of Tests and Criteria, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

IA.1 **General requirements**

Part 4;1 requirements must be met.

Packing Instruction 968

Table 968-IA

UN number and proper shipping name	*Net quantity per package*	
	Passenger	*Cargo*
UN 3090 **Lithium metal batteries**	2.5 kg	35 kg

IA.2 **Additional requirements**

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells and batteries must be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.
- Lithium metal batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
  - cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging; and
  - cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive, and placed inside an outer packaging.

IA.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

IB. **SECTION IB**

~~Section IB requirements apply to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II~~.

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Quantities of lithium metal cells or batteries that exceed the allowance permitted in Section II, Table 968-II, ~~must be assigned to Class 9 and~~ are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for ~~the following:~~ : the provisions of Part 6.

Lithium metal cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number “968” required by 5;4.1.5.8.1 a) must be supplemented with “IB”. All other applicable provisions of Part 5;4 apply.

~~— the provisions of Part 6; and~~
~~— the dangerous goods transport document requirements of 5;4, provided alternative written documentation is provided by the shipper describing the contents of the consignment. Where an agreement exists with the operator, the shipper may provide the information by electronic data processing (EDP) or electronic data interchange (EDI) techniques. The information required is as follows and should be shown in the following order:~~

~~1) the name and address of the shipper and consignee;~~
~~2) UN 3090;~~
~~3) Lithium metal batteries PI 968 IB;~~

Packing Instruction 968

DGP/24-WP/3 (paragraph 3.5.4) DGP/24-WP/55 and paragraphs 2.4.1.1 and 5.1.10 of this report

~~4) the number of packages and the gross mass of each package.~~

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium metal cells, the lithium content is not more than 1 g;
2) for lithium metal or lithium alloy batteries, the aggregate lithium content is not more than 2 g~~;~~.
~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

IB.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

DGP/24-WP/3 (paragraph 3.5.4) and paragraph 2.4.1.1 of this report

Table 968-IB

Contents	*Net quantity per ~~P~~package ~~quantity~~*	
	Passenger	*Cargo*
Lithium metal cells and batteries	2.5 kg~~G~~	2.5 kg~~G~~

IB.2 **Additional requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31) in addition to the Class 9 hazard label.
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Note.— This information may be provided on the dangerous goods transport document.

Packing Instruction 968

IB.3 **Outer packagings**

Boxes *Drums* *Jerricans*

Strong outer packagings

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew)and paragraph 2 of this packing instruction, lithium metal or lithium alloy cells and batteries offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and ~~if they meet all of~~ the following:

1) for a lithium metal cell, the lithium content is not more than 1 g;
2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g~~;~~.
3) ~~each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

4) ~~cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-II

Contents	*Lithium metal cells and/or batteries with a lithium content not more than 0.3 g*	*Lithium metal cells with a lithium content more than 0.3 g but not more than 1 g*	*Lithium metal batteries with a lithium content more than 0.3 g but not more than 2 g*
1	*2*	*3*	*4*
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 968-II must not be combined in the same package.

II.2 **Additional requirements**

— Cells and batteries must be packed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging.
— Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
— Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  — damage to cells or batteries contained therein;
  — shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  — release of contents.
— Each package must be labelled with a lithium battery handling label (Figure 5-31).
— Each consignment must be accompanied with a document with an indication that:

Packing Instruction 968

— the package contains lithium metal cells or batteries;
— the package must be handled with care and that a flammability hazard exists if the package is damaged;
— special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
— a telephone number for additional information.

— The words “lithium metal batteries, in compliance with Section II of PI968” must be placed on the air waybill, when an air waybill is used.
— Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

1. **Introduction**

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3.~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Part 4;1 requirements must be met.

UN number and proper shipping name		*Package quantity (Section I)*	
		Passenger	*Cargo*
UN 3091	**Lithium metal batteries packed with equipment**	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

Packing Instruction 969

I.2 **Additional requirements**

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- For the purpose of this packing instruction, "equipment" means apparatus requiring the lithium batteries with which it is packed for its operation.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
  - cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging surrounded by cushioning material that is non-combustible and non-conductive and placed inside an outer packaging.

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents),8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium metal cells and batteries packed with equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) ~~if they meet all of~~ and the following:

1) for a lithium metal cell, the lithium content is not more than 1 g;
2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g~~;~~.
~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

Packing Instruction 969

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

II.2 **Additional requirements**

- Lithium metal cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/24-WP/64 (paragraph 5.1.14 of this report)

- The ~~maximum~~ number of cells or batteries in each package must ~~be~~ not exceed the ~~minimum~~appropriate number ~~required to power~~ for the equipment's operation, plus two spares.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- The words "lithium metal batteries, in compliance with Section II of PI969" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes *Drums* *Jerricans*

Strong outer packagings

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

1. **Introduction**

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3~~:~~.

1) ~~be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

UN number and proper shipping name		*Package quantity (Section I)*	
		Passenger	*Cargo*
UN 3091	**Lithium metal batteries contained in equipment**	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

I.2 **Additional requirements**

— The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
— The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
— The quantity of lithium metal contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.

Packing Instruction 970

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium metal cells and batteries contained in equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and ~~if they meet all of~~ the following:

1) for a lithium metal cell, the lithium content is not more than 1 g;
2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.
~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;~~

~~Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.~~

~~Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN Manual of Tests and Criteria, Part III, subsection 38.3 may continue to be transported.~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

DGP/24-WP/58 (paragraph 5.1.11)

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 **General requirements**

Equipment containing batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

Packing Instruction 970

II.2 **Additional requirements**

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 5-31) (except button cell batteries installed in equipment (including circuit boards)).
- Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- Where a consignment includes packages bearing the lithium battery handling label, the words "lithium metal batteries, in compliance with Section II of PI970" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

. . .

See paragraph 2.4.1.7 of this report

Packing Instruction 971

Passenger and cargo aircraft for UN 3499 (see also Special Provision A186) and UN 3508 (Special Provision A196) only

General requirements

Part 4;1.1.1 and 1.1.8 requirements must be met.

For the purpose of this packaging instruction, a capacitor is considered an inner packaging.

UN number and proper shipping name		*Quantity — passenger*	*Quantity — cargo*
UN 3499	**Capacitor, electric double layer**	No limit	No limit
UN 3508	**Capacitor, asymmetric** (with an energy storage capacity greater than 0.3Wh)	No limit	No limit

ADDITIONAL PACKING REQUIREMENTS

For UN 3499

— Each capacitor must be transported in an uncharged state. The capacitor or, when fitted in a module, the module must be fitted with a metal strap connecting the terminals.
— Capacitors must be securely cushioned in the outer packagings.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes	*Drums*	*Jerricans*
Strong outer packagings		

. . .

See DGP/24-WP/3 (paragraph 3.5.2) for UN Model Regulations, P908 and P909 (in addition to SP 376 and SP377), ST/SG/AC.10/40/Add.

DGP/24-WP/2 (paragraph 3.2.24) and paragraph 2.5.1.1 of this report

Part 5

SHIPPER'S RESPONSIBILITIES

Chapter 1

GENERAL

. . .

1.1 GENERAL REQUIREMENTS

Before a person offers any package or overpack of dangerous goods for transport by air, that person must ensure that:

a) the articles or substances are not forbidden for transport by air (see Part 1, Chapter 2);

. . .

d) the dangerous goods transport document has been properly executed and the declaration signed;

~~e) an overpack is used for packages bearing the "Cargo aircraft only" label only if:~~

~~1) the packages are assembled in such a way that clear visibility and easy access to them is possible; or~~

~~2) the packages are not required to be accessible under 7;2.4.1; or~~

~~3) not more than one package is involved;~~

~~f~~e) the overpack does not contain packages of dangerous goods which require segregation according to Table 7-1;

~~g~~f) when an overpack is used, packages must be secured within the overpack;

~~h~~g) the dangerous goods are not included in any freight container/unit load device except for radioactive material as specified in 7;2.9 (subject to the approval of the operator, this does not apply to a unit load device containing consumer commodities prepared according to Packing Instruction Y963 or dry ice used as a refrigerant for other than dangerous goods when prepared according to Packing Instruction 954 or magnetized material when prepared according to Packing Instruction 953);

~~i~~h) before a package or overpack is reused, all inappropriate dangerous goods labels and markings are removed or completely obliterated;

~~j~~i) each package contained within an overpack is properly packed, marked, labelled and is free of any indication that its integrity has been compromised and in all respects is properly prepared as required in these Instructions. The "overpack" marking described in 2.4.10 is an indication of compliance with this requirement. The intended function of each package must not be impaired by the overpack; and

~~k~~j) packages and overpacks containing dangerous goods are offered to the operator separately from cargo which is not subject to these Instructions, except as provided for in 7;1.4.1.

Note 1.— Packages and overpacks containing dangerous goods may be included on the same air waybill as cargo which is not subject to these Instructions.

Note 2.— The requirement in 1.1 ~~k~~j) also applies to consolidated shipments offered to the operator.

Note 3.— For cooling purposes, an overpack may contain dry ice, provided that the overpack meets the requirements of Packing Instruction 954.

1.2 GENERAL PROVISIONS FOR CLASS 7

1.2.1 Approval of shipments and notification

UN Model Regulations, paragraph 5.1.5.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31 of this report) and paragraph 2.5.1.1 of this report

1.2.1.1 *General*

In addition to the approval ~~for~~ of package designs described in Part 6, Chapter 4, multilateral shipment approval is also required in certain circumstances (1.2.1.2 and 1.2.1.3). In some circumstances it is also necessary to notify competent authorities of a shipment (1.2.1.4).

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1.2.1.4 *Notifications*

Notification to competent authorities is required as follows:

a) Before the first shipment of any package requiring competent authority approval, the shipper must ensure that copies of each applicable competent authority certificate applying to that package design have been submitted to the competent authority of the country of origin of the shipment and to the competent authority of each country through or into which the consignment is to be transported. The shipper is not required to await an acknowledgement from the competent authority, nor is the competent authority required to make such acknowledgement of receipt of the certificate;

b) For each of the following types of shipments:

i) Type C packages containing radioactive material with an activity greater than 3000 A_1 or 3000 A_2, as appropriate, or 1000 TBq, whichever is the lower;

ii) Type B(U) packages containing radioactive material with an activity greater than 3000 A_1 or 3000 A_2, as appropriate, or 1000 TBq, whichever is the lower;

iii) Type B(M) packages;

iv) Shipment under special arrangement;

the shipper must notify the competent authority of the country of origin of the shipment and the competent authority of each country through or into which the consignment is to be transported. This notification must be in the hands of each competent authority prior to the commencement of the shipment, and preferably at least 7 days in advance;

UN Model Regulations, paragraph 5.1.5.1.4 c), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31.1 a)), paragraphs 2.5.1.1 and 2.6.1.2 of this report

c) The shipper is not required to send a separate notification if the required information has been included in the application for ~~shipment~~ approval of shipment (see 6;7.22) ;

d) The consignment notification must include:

i) sufficient information to enable the identification of the package or packages including all applicable certificate numbers and identification marks;

ii) information on the date of shipment, the expected date of arrival and proposed routeing;

iii) the names of the radioactive material or nuclides;

iv) descriptions of the physical and chemical forms of the radioactive material, or whether it is special form radioactive material or low dispersible radioactive material; and

v) the maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with an appropriate SI prefix symbol (see 1;3.2). For fissile material, the mass of fissile material (or of each fissile nuclide for mixtures when appropriate) in units of grams (g), or multiples thereof, may be used in place of activity.

1.2.2 Certificates issued by the competent authority

UN Model Regulations, paragraph 5.1.5.2.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.2.2.1 Certificates issued by the competent authority are required for the following:

a) Designs for:

i) special form radioactive material;

ii) low dispersible radioactive material;

iii) fissile material excepted under 2;7.2.3.5.1 f)

~~iii~~iv)packages containing 0.1 kg or more of uranium hexafluoride;

~~iv~~) ~~all~~ packages containing fissile material unless excepted by 2;7.2.3.5, 6;7.10.2 or 6;7.10.3;

vi) Type B(U) packages and Type B(M) packages;

vii) Type C packages;

b) Special arrangements;

c) Certain shipments (1.2.1.2);

d) Determination of the basic radionuclide values referred to in 2;7.2.2.1 for individual radionuclides which are not listed in Table 2-12 (see 2;7.2.2.2 a));

e) Alternative activity limits for an exempt consignment of instruments or articles (see 2;7.2.2.2 b));.

The certificates must confirm that the applicable requirements are met, and for design approvals, must attribute to the design an identification mark.

The certificates of approval for the package design and shipment ~~approval certificates~~ may be combined into a single certificate.

Certificates and applications for these certificates must be in accordance with the requirements in 6;7.22.

1.2.2.2 The shipper must be in possession of a copy of each applicable certificate.

UN Model Regulations, paragraph 5.1.5.2.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.2.2.3 For package designs where it is not required that a competent authority issue~~d~~ a certificate ~~is not required~~ of approval, the shipper must, on request, make available for inspection by the relevant competent authority, documentary evidence of the compliance of the package design with all the applicable requirements.

1.2.3 Determination of transport index (TI) and criticality safety index (CSI)

1.2.3.1 Determination of transport index

1.2.3.1.1 The transport index (TI) for a package, overpack or freight container, must be the number derived in accordance with the following procedure:

a) Determine the maximum radiation level in units of millisieverts per hour (mSv/h) at a distance of 1 m from the external surfaces of the package, overpack, or freight container. The value determined must be multiplied by 100 and the resulting number is the transport index. For uranium and thorium ores and their concentrates, the maximum radiation level at any point 1 m from the external surface of the load may be taken as:

0.4 mSv/h for ores and physical concentrates of uranium and thorium;

0.3 mSv/h for chemical concentrates of thorium;

0.02 mSv/h for chemical concentrates of uranium, other than uranium hexafluoride;

b) For freight containers, the value determined in step a) above must be multiplied by the appropriate factor from Table 5-1;

c) The value obtained in steps a) and b) above must be rounded up to the first decimal place (e.g. 1.13 becomes 1.2), except that a value of 0.05 or less may be considered as zero.

1.2.3.1.2 The transport index for each overpack or freight container must be determined as either the sum of the transport indices of all the packages contained, or by direct measurement of radiation level, except in the case of non-rigid overpacks for which the transport index must be determined only as the sum of the transport indices of all the packages.

Table 5-1. Multiplication factors for freight containers

*Size of load**	*Multiplication factor*
size of load ≤ 1 m^2 1 m^2 < size of load ≤ 5 m^2 5 m^2 < size of load ≤ 20 m^2 20 m^2 < size of load	1 2 3 10
* Largest cross-sectional area of the load being measured.	

1.2.3.1.3 The criticality safety index for each overpack or freight container must be determined as the sum of the CSIs of all the packages contained. The same procedure must be followed for determining the total sum of CSIs in a consignment or aboard an aircraft.

UN Model Regulations, paragraph 5.1.5.3.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.2.3.1.4 Packages ~~and~~, overpacks and freight containers must be assigned to either category I-WHITE, II-YELLOW or III-YELLOW in accordance with the conditions specified in Table 5-2 and with the following requirements:

a) for a package ~~or~~, overpack or freight container, both the transport index and the surface radiation level conditions must be taken into account in determining which is the appropriate category. Where the transport index satisfies the condition for one category but the surface radiation level satisfies the condition for a different category, the package ~~or~~, overpack or freight container must be assigned to the higher category. For this purpose, category I-WHITE must be regarded as the lowest category;

b) the transport index must be determined following the procedures specified in 1.2.3.1.1 and 1.2.3.1.2;

c) if the surface radiation level is greater than 2 mSv/h, the package or overpack must be transported under exclusive use and under the provisions of 7;2.10.5.3, as appropriate;

d) a package transported under a special arrangement must be assigned to category III-YELLOW except under the provisions of 1.2.3.1.5;

e) an overpack or freight container which contains packages transported under special arrangement must be assigned to category III-YELLOW except under the provisions of 1.2.3.1.5.

UN Model Regulations, Table 5.1.5.3.4, ST/SG/AC.10/40/Add.1
DGP /24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

Table 5-2. Categories of packages ~~and~~, overpacks and freight containers

Conditions		
Transport index	*Maximum radiation level at any point on external surface*	*Category*
0*	Not more than 0.005 mSv/h	I-WHITE
More than 0 but not more than 1*	More than 0.005 mSv/h but not more than 0.5 mSv/h	II-YELLOW
More than 1 but not more than 10	More than 0.5 mSv/h but not more than 2 mSv/h	III-YELLOW
More than 10	More than 2 mSv/h but not more than 10 mSv/h	III-YELLOW**
* If the measured transport index is not greater than 0.05, the value quoted may be zero in accordance with 1.2.3.1.1 c). ** Must be transported under exclusive use and special arrangement except for freight containers (see Table 7-6).		

UN Model Regulations, paragraph 5.1.5.3.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.2.3.1.5 In all cases of international transport of packages requiring competent authority approval of design or shipment ~~approval~~, for which different approval types apply in the different countries concerned by the shipment, the categorization must be in accordance with the certificate of the country of origin of design.

UN Model Regulations, paragraph 5.1.5.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.2.4 Specific provisions for excepted packages of radioactive material of Class 7

1.2.4.1 Excepted packages of radioactive material of Class 7 must be legibly and durably marked on the outside of the packaging with:

a) the UN number preceded by the letters “UN”;

b) an identification of either the shipper or consignee, or both; and

c) the permissible gross mass if this exceeds 50 kg.

UN Model Regulations, paragraph 5.1.5.4.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31.1 b)) and paragraph 2.5.1.1 of this report

Removal of a reference to 5;4.1.6.2 in 1.2.4.2 b) below was deleted following DGP-WG/13, as this requirement is covered by the last sentence in this paragraph.

1.2.4.2 The documentation requirements of 5;4 do not apply to excepted packages of radioactive material of Class 7, except that ~~information must be shown on a transport document such as an air waybill or other similar document. The information required is as follows and should be shown in the following order~~:

a) the UN number preceded by the letters “UN” and the name and address of the shipper and the consignee and, if relevant, the identification mark for each competent authority certificate of approval (see 5;4.1.5.7.1 g)) must be shown on a transport document such as an air waybill or other similar document complying with the requirements of 5;4.1.2.1 to 5;4.1.2.4; ~~and~~

b) ~~the proper shipping name~~the requirements, if relevant, of 4.1.5.7.1 g), 4.1.5.7.3 and 4.1.5.7.4 apply; and

c) the requirements of 4.4 apply.

Where an agreement exists with the operator, the shipper may provide the information by EDP or EDI techniques.]

UN Model Regulations, paragraph 5.1.5.4.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.2.4.3 The requirements of 2.4.5.2 and 3.5.1.1 k) apply if relevant.

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1.5 SALVAGE PACKAGINGS

Before a person offers any salvage packaging for transport by air, that person must ensure that:

— it is marked with the proper shipping name and UN number of, and bear all the labels appropriate for, the dangerous goods contained therein;

UN Model Regulations, paragraph 5.2.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

— it is marked with the word “Salvage” and the lettering of the “Salvage” marking must be at least 12 mm high;

— the words “Salvage package” are added after the description of the goods in the dangerous goods transport document required by 4.1; and

— where the package contains dangerous goods restricted to transport on cargo aircraft only, it bears a “Cargo aircraft only” label and the dangerous goods transport document contains the necessary statement according to 4.1.5.7.1 b).

In addition, that person must ensure that all other applicable requirements are met.

UN Model Regulations, paragraph 5.2.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

Note.— The size requirement for the “Salvage” marking applies as from 1 January 2016.

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1.6 EMPTY PACKAGINGS

1.6.1 Other than for Class 7, a packaging which previously contained dangerous goods must be identified, marked, labelled and placarded as required for those dangerous goods unless steps such as cleaning, purging of vapours or refilling with a non-dangerous substance are taken to nullify any hazard.

1.6.2 Before an empty packaging which had previously contained an infectious substance is returned to the shipper, or sent elsewhere, it must be disinfected or sterilized to nullify any hazard, and any label or marking indicating that it had contained an infectious substance must be removed or obliterated.

UN Model Regulations, paragraph 5.1.3.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

1.6.3 Freight containers as well as other ~~P~~packagings and overpacks used for the transport of radioactive material must not be used for the storage or transport of other goods unless decontaminated below the level of 0.4 Bq/cm2 for beta and gamma emitters and low toxicity alpha emitters and 0.04 Bq/cm2 for all other alpha emitters.

Chapter 2

PACKAGE MARKINGS

. . .

2.4 MARKING SPECIFICATIONS AND REQUIREMENTS

2.4.1 Marking with proper shipping name and UN or ID number

UN Model Regulations, paragraph 5.2.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

2.4.1.1 Unless otherwise provided in these Instructions, the proper shipping name of the dangerous goods (supplemented with the technical name(s) if appropriate, see Part 3, Chapter 1) and, when assigned, the corresponding UN number preceded by the letters "UN" or "ID", as appropriate, must be displayed on each package. The UN number and the letters "UN" or "ID" must be at least 12 mm high, except for packagings of 30 litres capacity or less or of 30 kg maximum net mass and for cylinders of 60 litres water capacity ~~or less~~, when they must be at least 6 mm in height and except for packagings of 5 litres or 5 kg or less when they must be of an appropriate size. In the case of unpackaged articles, the marking must be displayed on the article, on its cradle or on its handling, storage or launching device. A typical package marking would be:

"Corrosive liquid, acidic, organic, n.o.s. (caprylyl chloride) UN 3265".

~~*Note.— The size requirements for the UN number marking will become mandatory from 1 January 2014.*~~

2.4.1.2 For solid substances, unless the word "molten" is already included in the proper shipping name, it must be added to the proper shipping name on the package when a substance is offered for air transport in the molten state (see Part 3, Chapter 1).

Note.— Additional descriptive text in the entries in column 1 of the Dangerous Goods List (Table 3-1) are not part of the proper shipping name but may be used in addition to the proper shipping name.

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2.4.5 Special marking requirements for radioactive material

UN Model Regulations, paragraph 5.2.1.5.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31.1 c)) and paragraph 2.5.1.1 of this report

~~2.4.5.1 Each package must be legibly and durably marked on the outside of the packaging with an identification of either the shipper or consignee, or both. Each overpack must be legibly and durably marked on the outside of the overpack with an identification of either the shipper or consignee or both unless these markings of all packages within the overpack are clearly visible.~~

UN Model Regulations, paragraph 5.2.1.5.2, ST/SG/AC.10/40/Add.1
Moved from current 5;2.4.5.1 e):

2.4.5.1 The marking of excepted packages of radioactive material of Class 7 must be as required by 1.2.4.1.

~~a)~~2.4.5.2 ~~e~~Each package of gross mass exceeding 50 kg must have its permissible gross mass legibly and durably marked on the outside of the packaging~~;~~.

~~b)~~2.4.5.3 ~~e~~Each package which conforms to:

~~i~~a) a Type IP-1 package, a Type IP-2 package or a Type IP-3 package design must be legibly and durably marked on the outside of the packaging with "TYPE IP-1", "TYPE IP-2" or "TYPE IP-3" as appropriate;

~~ii~~b) a Type A package design must be legibly and durably marked on the outside of the packaging with "TYPE A";

~~iii~~c) a Type IP-2 package, a Type IP-3 package or a Type A package design must be legibly and durably marked on the outside of the packaging with the international vehicle registration code (VRI Code) of the country of origin of

design and either the name of the manufacturer, or other identification of the packaging specified by the competent authority of the country of origin of design.

UN Model Regulations, paragraph 5.2.1.5.5, ST/SG/AC.10/40/Add.1 and ST/SG/AC.10/C.3/86/Add.1
DGP/24-WP/3 (paragraph 3.2.31.1 a)) and paragraph 2.5.1.1 of this report

~~c)~~2.4.5.4 ~~e~~Each package which conforms to a design approved ~~by the competent authority~~ under one or more of paragraphs 1.2.2.1, 6;7.21 to 6;7.21.4, [6;7.22.4 to 6;7.22.7] and 6;7.23.2.1 must be legibly and durably marked on the outside of the ~~packaging~~ package with the following information:

~~i~~a) the identification mark allocated to that design by the competent authority;

~~ii~~b) a serial number to uniquely identify each packaging which conforms to that design; and

~~iii~~c) "Type B(U)", "Type B(M)" or "Type C" in the case of a Type B(U) ~~or~~, Type B(M) or Type C package design~~, with "TYPE B(U)" or "TYPE B(M)"; and~~.

~~iv) in the case of a Type C package design, with "TYPE C".~~

DGP/24-WP/3 (paragraph 3.2.16) and paragraph 2.5.1.1 of this report

Note.— Empty Type B(U) or Type B(M) packages as specified in the note to 2;7.2.4.1.1.7 shipped as industrial packages Type IP-1 must bear the appropriate specification marking for a Type IP-1 in which case the appropriate specification markings specified in 2.4.5.4 must be obliterated.

UN Model Regulations, paragraph 5.2.1.5.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

~~d)~~2.4.5.5 ~~e~~Each package which conforms to a Type B(U), Type B(M) or Type C package design must have the outside of the outermost receptacle which is resistant to the effects of fire and water plainly marked by embossing, stamping or other means resistant to the effects of fire and water with the trefoil symbol, as shown in Figure 5-1 below~~:~~.

Moved above (5;2.4.5.2):

~~e)The marking of excepted packages must be as required by 1.2.4.~~

2.4.5.~~2~~.6 In all cases of international transport of packages requiring competent authority approval of design or shipment ~~approval~~, for which different approval types apply in the different countries concerned by the shipment, the marking must be in accordance with the certificate of the country of origin of the design.

. . .

UN Model Regulations, paragraph 5.2.1.6.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report
Editorial amendment to 2.4.9.1 made post DGP/13 which allows for deletion of 2.4.9.4

2.4.9 Special marking provisions for environmentally hazardous substances

2.4.9.1 Unless otherwise specified in these Instructions, p~~P~~ackages containing environmentally hazardous substances meeting the criteria of 2;9.2.1 a) (UN Nos. 3077 and 3082) must be durably marked with the environmentally hazardous substance mark~~, with the exception of single packagings and combination packagings where such single packagings or inner packagings of such combination packagings have:~~ and the packages must also bear a Class 9 hazard label.

~~a net quantity of 5 L or less for liquids; or~~
~~a net mass of 5 kg or less for solids.~~

2.4.9.2 The environmentally hazardous substance mark must be located adjacent to the markings required by 2.4.1.1. The requirements of 2.2.2 must be met.

UN Model Regulations, paragraph 5.2.1.6.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

2.4.9.3 The environmentally hazardous substance mark must be as shown in Figure 5-2. The marking must be in the form of a square set at an angle of 45° (diamond-shaped). The symbol (fish and tree) must be black on white or suitable contrasting background. ~~For packagings, t~~The minimum dimensions must be 100 mm × 100 mm and the minimum width of line forming the diamond must be 2 mm~~, except in the case of packages of such dimensions that they can only bear smaller marks~~. If the size of the package so requires, the dimensions/line thickness may be reduced, provided the marking remains clearly visible. Where dimensions are not specified, all features must be in approximate proportion to those shown.

Note.— The labelling provisions of 5;3 apply in addition to any requirement for packages to bear the environmentally hazardous substance mark.

~~*Note 2.— The provisions of 5;2.4.9.3 from the 2013-2014 Edition of these Instructions may continue to be applied until 31 December 2016.*~~

~~2.4.9.4 Regardless of the application of 2.4.9.1, all packages containing environmentally hazardous substances (UN Nos. 3077 and 3082) must bear a Class 9 hazard label.~~

UN Model Regulations, Figure 5.2.2 and paragraph 5.1.2.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31 of this report) and paragraph 2.5.1.1 of this report

Replace mark for environmentally hazardous substances with the following:



Figure 5-2. Symbol (fish and tree): black on white or suitable contrasting background

. . .

2.4.10 Marking of overpacks

An overpack must be marked with the word “Overpack”, with the proper shipping name, UN number, and special handling instructions appearing on interior packages for each item of dangerous goods contained in the overpack unless markings and labels representative of all dangerous goods in the overpack are visible, except as required in 3.2.6 and 3.5.1.1 h) to i). Packaging specification markings must not be reproduced on the overpack. When packages containing dangerous goods in limited quantities are placed in an overpack, the overpack must also be marked with the limited quantity marking shown in Figure 3-1 unless the markings representative of all dangerous goods in the overpack are visible. The lettering of the “Overpack” marking must be at least 12 mm high.

Note.— The size requirement for the “Overpack” marking applies as from 1 January 2016.

. . .

Chapter 3

LABELLING

. . .

UN Model Regulations, paragraph 5.2.2.1.12.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

3.2.6 Except when enlarged labels are used in accordance with 3.6, each package, overpack and freight container containing radioactive material must bear ~~at least~~ the ~~two~~ labels ~~which~~ conforming to Figures 5-1~~8~~9, 5-~~19~~20 and 5-20~~1~~ ~~as~~ according to the appropriate ~~according to the~~ category ~~(see 5;1.2.3.1.4) of that package, overpack or freight container~~. Labels must be affixed to two opposite sides on the outside of the package or overpack or on the outside of all four sides of ~~the~~ a freight container. Each overpack containing radioactive material must bear at least two labels on opposite sides of the outside of the overpack. In addition, each package, overpack and freight container containing fissile material, other than fissile material excepted under the provisions of ~~6;7.10.2~~ 2;7.2.3.5 must bear labels ~~which~~ conforming to the model shown in Figure 5-~~21~~22; such labels, where applicable, must be affixed adjacent to the labels ~~for radioactive material~~ conforming to Figure 5-19, 5-20, or 5-21, as applicable. Labels must not cover the markings specified in Chapter 2. Any labels which do not relate to the contents must be removed or covered.

. . .

DGP/24-WP/56 (paragraph 2.5.2 of this report)

3.2.8 Except as provided in 3.5.1.1 d), each class hazard label must:

a) be affixed to a background of contrasting colour or must have a dotted or solid line outer boundary;

b) be located on the same surface of the package near the proper shipping name marking, if the package dimensions are adequate;

c) be so placed on the packaging that they are not covered or obscured by any part of or attachment to the packaging or any other label or marking;

d) when primary and subsidiary risk labels are required, be displayed next to each other; and

e) ~~in case of hazard warning labels,~~ be affixed at an angle of 45° (diamond shaped), unless the package dimensions are inadequate.

. . .

3.2.12 In addition to the class hazard labels specified in 3.1, handling labels must also be affixed to packages of dangerous goods as follows:

. . .

e) for excepted packages of radioactive material the “Radioactive material, excepted package” handling label (Figure 5-30) must be affixed ~~.~~;

f) be affixed to a background of contrasting colour or must have a dashed or solid line outer boundary;

g) be so placed on the packaging that they are not covered or obscured by any part of or attachment to the packaging or any other label or marking.

. . .

UN Model Regulations, paragraph 5.2.2.1.12.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31) and paragraph 2.5.1.1 of this report

3.5 LABEL SPECIFICATIONS

. . .

3.5.1 Class hazard label specifications

3.5.1.1 Labels must satisfy the provisions of this section and conform, in terms of colour, symbols and general format, to the specimen labels shown in Figures 5-3 to 5-24.

Note.— Where appropriate, labels in Figures 5-3 to 5-24 are shown with a dotted outer boundary as provided for in 3.5.1.1 a). This is not required when the label is applied on a background of contrasting colour.

Class hazard labels must conform to the following specifications:

UN Model Regulations, paragraph 5.2.2.2.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.31 d)) and paragraph 2.5.1.1 of this report

a) Labels must be configured as shown in Figure 5-3.

UN Model Regulations, paragraph 5.2.2.2.1.1.1, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

i) Labels must be displayed on a background of contrasting colour, or must have either a dotted or solid outer boundary line.

UN Model Regulations, paragraph 5.2.2.2.1.1.2, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report
Editorial amendment to 3.5.1.1 a) iii) made post DGP/13

ii) ~~They~~ The label must be in the form of a square set at an angle of 45° (diamond shaped). The ~~with~~ minimum dimensions ~~of~~ must be 100 mm × 100 mm and the minimum width of the line inside the edge forming the diamond must be 2 mm.~~, set at an angle of 45° (diamond shaped) except that labels of 50 mm × 50 mm may be used on packages containing infectious substances where the packages are of dimensions such that they can only bear smaller labels. They~~ The line inside the edge must be parallel and ~~must have a line~~ 5 mm ~~inside the edge and running parallel with it~~ from the outside of that line to the edge of the label. The line inside the edge on ~~In~~ the upper half of ~~a~~ the label ~~the line~~ must ~~have~~ be the same colour as the symbol, and the line inside the edge on ~~in~~ the lower half of the label ~~it~~ must ~~have~~ be the same colour as the ~~figure in the bottom corner~~ class or division number in the bottom corner. ~~Labels are divided into halves. With the exception of Divisions 1.4, 1.5 and 1.6, the upper half of the label must contain the pictorial symbol and the lower half must contain the class or division number (and for goods of Class 1, the compatibility group letter) as appropriate. The label may include text such as the UN number or words describing the hazard class or division (e.g. "flammable") in accordance with f) provided the text does not obscure or detract from the other required label elements.~~ Where dimensions are not specified, all features must be in approximate proportion to those shown.

iii) Labels of 50 mm × 50 mm may be used on packages containing infectious substances where the packages are of dimensions such that they can only bear smaller labels. The line inside the edge must remain 5 mm to the edge of the label. The minimum width of the line inside the edge must remain 2 mm. Dimensions for labels on cylinders must comply with 3.5.1.1 b).

UN Model Regulations, paragraph 5.2.2.2.1.1.3, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report
The date in the second sentence of the note below was changed post DGP/13 from 31 December 2016 to 1 January 2017.

Note.— The provisions of 3.5.1.1 a) from the 2013-2014 Edition of these Instructions may continue to be applied until 31 December 2016. When so applied, 3.5.1.1 a) i), ii), and iii) need not apply until 1 January 2017.

Reorder the following paragraphs as shown. 5;3.5.1.1 b) = UN 5.2.2.2.1.2, 5;3.5.1.1 c) = UN 5.2.2.2.1.3, 5;3.5.1.1 d) ≈ UN 5.2.2.2.1.4, 5;3.5.1.1 e) ≈ UN 5.2.2.2.1.5, 5;3.5.1.1 f) ≈ UN 5.2.2.2.1.6, 5;3.5.1.1 g) not in UN, 5;3.5.1.1 h) = UN 5.2.2.1.12.2

~~b~~f) The symbols, texts and numbers must be shown in black on all labels except:

1) the Class 8 label, where the text (if any) and class number must appear in white;

2) labels with entirely green, red or blue backgrounds, where they may be shown in white; ~~and~~

3) the Division 5.2 label, where the symbol may be shown in white~~.~~; and

4) the Division 2.1 label displayed on cylinders and gas cartridges for liquefied petroleum gases, where they may be shown in the background colour of the receptacle if adequate contrast is provided.

~~c~~d) In addition, ~~E~~except for Divisions 1.4, 1.5 and 1.6~~,~~ labels for Class 1 must show in the lower half, above the class number, the division number and compatibility group letter for the substance or article. Labels for Divisions 1.4, 1.5 and 1.6 must show in the upper half the division number and in the lower half the class number and the compatibility group letter.

~~d~~b) Cylinders for Class 2 may, on account of their shape, orientation and securing mechanisms for transport, bear labels representative of those specified in this chapter, which have been reduced in size, according to ISO 7225:2005, for display on the non-cylindrical part (shoulder) of such cylinders. Labels may overlap to the extent provided for by ISO 7225:2005 "Gas cylinders — Precautionary labels"; however, in all cases the labels representing the primary hazard and the numbers appearing on any label must remain fully visible and the symbols recognizable.

~~e~~c) With the exception of labels for Divisions 1.4, 1.5 and 1.6 of Class 1, the upper half of the label must contain the pictorial symbol and the lower half must contain the class or, ~~I~~in the case of labels for Class 5, the division number ~~of the substance must be shown in the bottom corner of the label~~, as appropriate. ~~For all other labels, the class number must be shown in the bottom corner of the label.~~ The label may include such text as the UN number, or words describing the hazard class (e.g. "flammable") in accordance with 3.5.1.1 e) provided that the text does not obscure or detract from the other required label elements.

~~f~~e) Unless otherwise provided for in these Instructions, only text indicating the nature of the risk may be inserted in the lower half of the label (in addition to the class or division number or compatibility group).

g) A label may contain form identification information, including the name of its maker, provided that information is printed outside of the solid line border in no larger than 10-point type.

Labelling of radioactive material

UN Model Regulations, paragraph 5.2.2.1.12.2, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

h) Each label conforming to the applicable Figure~~s~~ 5-~~18~~19, 5-~~19~~20 ~~and~~ or 5-~~20~~21 must be completed with the following information:

1) Contents:

A) except for LSA-I material, the name(s) of the radionuclide(s) as taken from Table 2-12, using the symbols prescribed therein. For mixtures of radionuclides, the most restrictive nuclides must be listed to the extent the space on the line permits. The group of LSA or SCO must be shown following the name(s) of the radionuclide(s). The terms "LSA-II","LSA-III", "SCO-I" and "SCO-II" must be used for this purpose;

B) for LSA-I material, the term "LSA-I" is all that is necessary; the name of the radionuclide is not necessary;

2) Activity: The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol. For fissile material, the total mass of fissile ~~material (or mass of each fissile~~ nuclide~~s for mixtures when appropriate)~~ in units of grams (g), or multiples thereof, may be used in place of activity;

3) For overpacks and freight containers the "contents" and "activity" entries on the label must bear the information required in 3.5.1.1 h) 1) A) and B), respectively, totalled together for the entire contents of the overpack or freight container except that on labels for overpacks or freight containers containing mixed loads of packages containing different radionuclides, such entries may read "See Transport Documents";

4) Transport index: The number determined in accordance with 1.2.3.1.1 and 1.2.3.1.2. (No transport index entry is required for category I-WHITE.)

UN Model Regulations, paragraph 5.2.2.1.12.3, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

i) Each label conforming to the Figure 5-~~21~~22 must be completed with the criticality safety index (CSI) as stated in the certificate of approval ~~for special arrangement or the certificate of approval for the package design~~ applicable in the States through or into which the consignment is transported and issued by the competent authority.

UN Model Regulations, paragraph 5.2.2.1.12.4, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

j) For overpacks and freight containers, the label conforming to Figure 5-22 must bear the sum of the criticality safety indexes ~~(CSI) on the label must bear the information required in h) above totalled together for the fissile contents of the overpack or freight container~~ of all the packages contained therein.

UN Model Regulations, paragraph 5.2.2.1.12.5, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

k) In all cases of international transport of packages requiring competent authority approval of design or shipment ~~approval~~, for which different approval types apply in the different countries concerned by the shipment, the labelling must be in accordance with the certificate of the country of origin of design.

3.5.1.2 Illustrations of the class hazard labels, showing the approved symbols and colours, are given in Figures 5-~~3~~4 to 5-~~23~~24. The label descriptions used in column 5 of Table 3-1 are indicated in parentheses.

Note 1.— The asterisk appearing in the bottom corner of the label indicates the location of the class or division number when the label is used to show the primary risk. See Figures 5-~~3~~4 to 5-~~6~~7 concerning the location of information on explosives labels.

Note 2.— Minor variations in the design of the symbol on labels or other differences such as the width of vertical lines on labels as shown in these Instructions or in regulations of other modes, which do not affect the obvious meaning of the label, are acceptable. For example the hand shown on the Class 8 label may be shown with or without shading, the extreme right and left vertical lines on the Division 4.1 and Class 9 label may extend to the edge of the label or there may be some white space at the edge, etc.

. . .

DGP/24-WP/2 (paragraph 3.2.22), paragraph 2.5.1.1 of this report and DGP/24-WP/73 (paragraph 5.1.16 of this report)

3.5.2 Handling labels

3.5.2.1 Handling label specifications

An illustration of each of the handling labels showing the approved design and colour is given in Figures 5-~~24~~25 to 5-~~26~~27 and Figures 5-~~28~~29 to 5-~~31~~32. The minimum label dimensions are shown in the figures~~.~~; Where dimensions or features are not specified, these must be in approximate proportion to those shown; however:

a) labels having dimensions not smaller than half of those indicated may be used on packages containing infectious substances when the packages are of dimensions such that they can only bear smaller labels; and

b) orientation labels may meet the specification of either Figure 5-~~26~~27 or ISO Standard 780:1997.

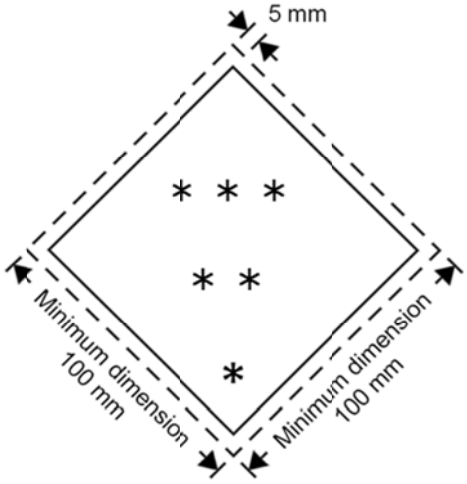
3.5.2.2 Lithium battery handling label

Packages containing lithium batteries that meet the requirements of Section II of Packing Instructions 965 to 970 must bear a “Lithium battery” handling label shown in Figure 5-~~31~~32, as required by the applicable packing instruction. The label must be a minimum dimension of 120 mm wide × 110 mm high except labels of ~~74~~105 mm wide × ~~105~~74 mm high may be used on packages containing lithium batteries where the packages are of dimensions such that they can only bear smaller labels. When the reduced size label is used, the label features must be in approximate proportion to those shown on the full-size label (Figure 5-32). The label must show “Lithium metal batteries” or “Lithium ion batteries”, as applicable, and a telephone number for additional information. Where the package contains both types of batteries, the label must show “Lithium metal and lithium ion batteries”. Packages containing lithium batteries that meet the requirements of Section IB of

Packing Instructions 965 and 968 must bear both a “Lithium battery” handling label shown in Figure 5-~~31~~32 and a Class 9 hazard label (Figure 5-~~23~~24).

. . .

Insert the following new Figure 5-3:



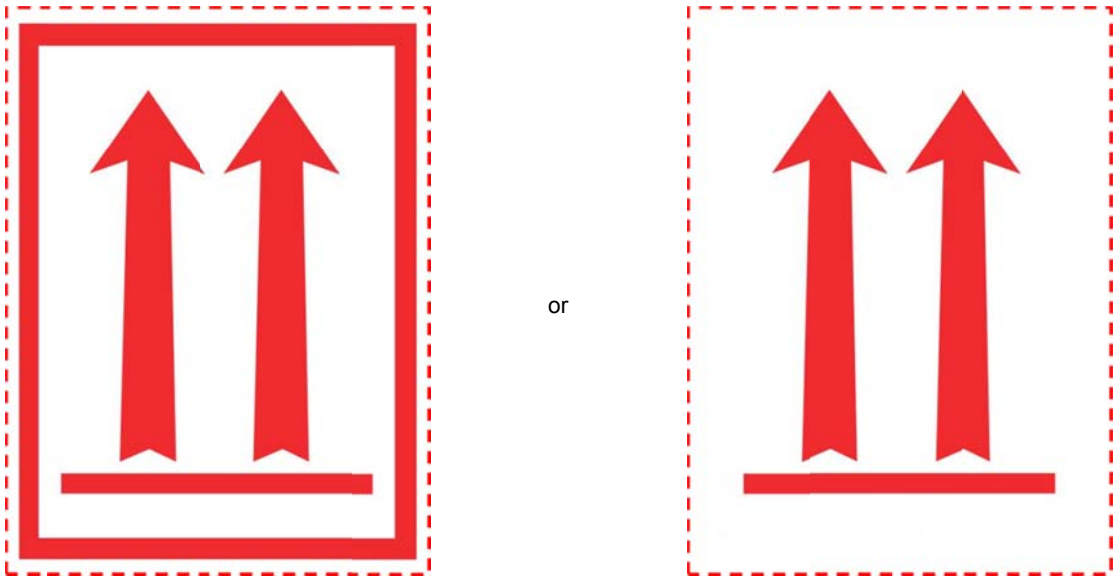
* The class or, for Divisions 5.1 and 5.2, the division number must be shown in the bottom corner
** Additional text/numbers/letters must (if mandatory) or may (if optional) be shown in this bottom half
*** The class or division symbol or, for Divisions 1.4, 1.5 and 1.6, the division number and for Figure 5-22 the word “FISSILE” must be shown in this top half”.

Figure 5-3. Class/division label

***Renumber* subsequent figures accordingly**

UN Model Regulations, paragraph 5.2.1.7.1 (Figures 5.2.3 and 5.2.4), ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

Replace Figure 5-26 with the following:

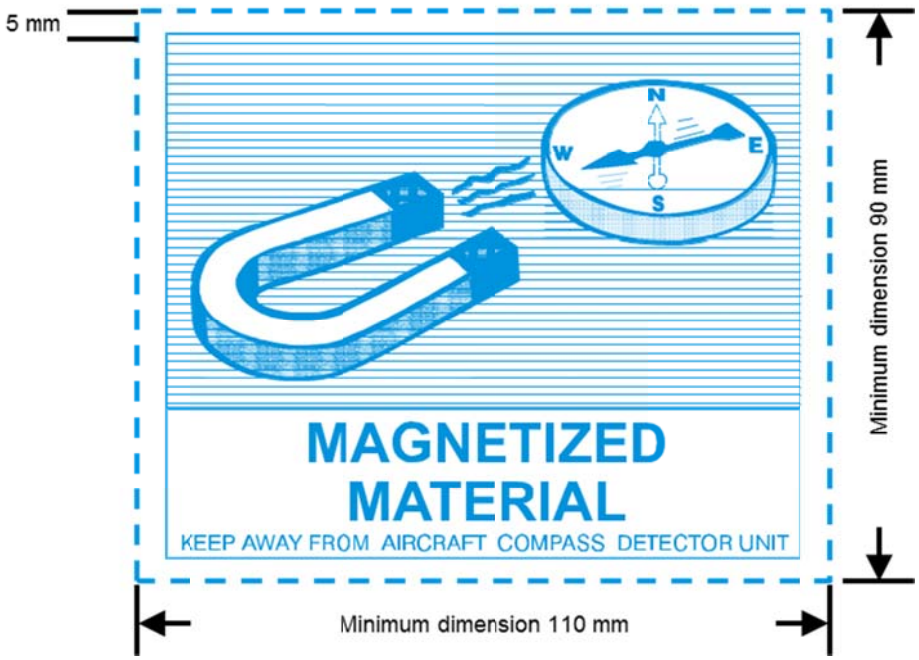


Two black or red arrows on white or suitable contrasting background
The rectangular border is optional
All features must be in approximate proportion to those shown
Dimensions: 74 mm × 105 mm

Figure 5-~~26~~27. Package orientation

DGP/24-WP/2 (paragraph 3.2.22) and paragraph 2.5.1.1 of this report

~~(Magnetic)~~



Colour: blue on white

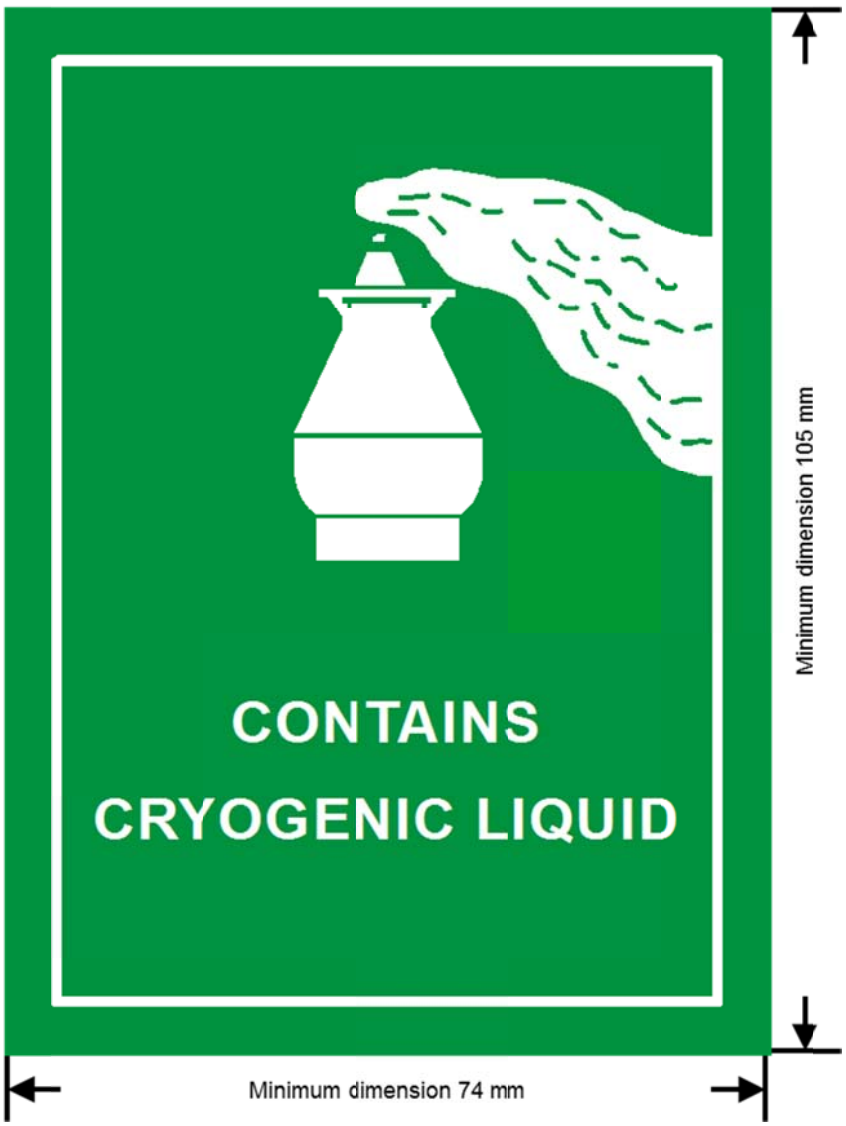
~~Dimensions: 110 mm × 90 mm~~

Figure 5-~~24~~25. Magnetized material



Colour: black on orange
~~Dimensions: 120 mm × 110 mm~~

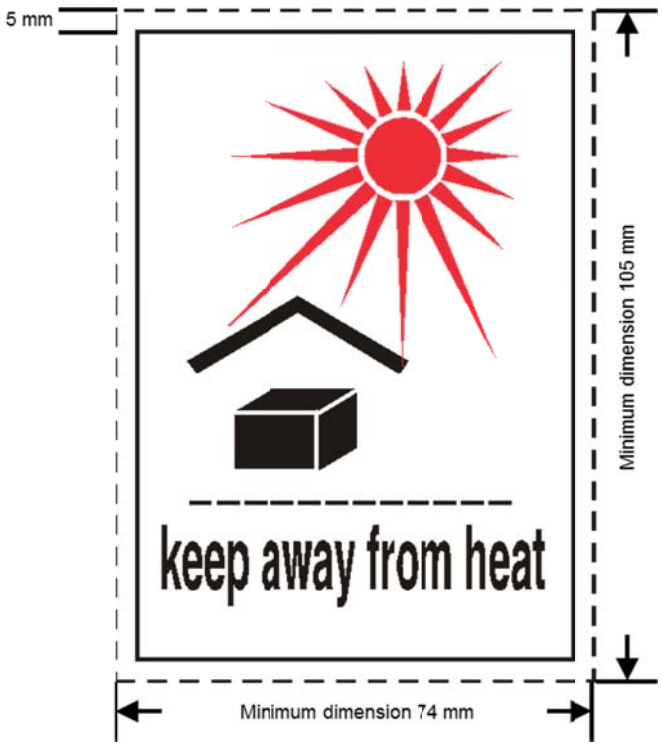
Figure 5-~~25~~26. Cargo aircraft only



Symbol: white
Background: green
~~Dimensions: 75 mm x 105 mm~~

Note.— The words "Caution — may cause cold burn injuries if spilled or leaked" are optional and may be included.

Figure 5-~~28~~29. Cryogenic liquid label



Colour: red or black on a white background
~~Dimensions: 74 mm × 105 mm~~

Figure 5-~~29~~30. Keep away from heat



Colour: red or black on a contrasting background
~~Dimensions: 74 mm × 105 mm~~

Note.— The words "The information for this package need not appear on the Notification to Captain (NOTOC)" are optional and may be included.

Figure 5-~~30~~31. Radioactive material, excepted package



Colour: red on a contrasting background
~~Dimensions: 120 × 110 mm~~

* Place for "Lithium ion battery" and/or "Lithium metal battery"

** 105 mm wide × 74 mm high may be used in accordance with 5;3.5.2.2

Figure 5-~~31~~32. Lithium battery handling label

Chapter 4

DOCUMENTATION

. . .

4.1.5.7 *Radioactive material*

4.1.5.7.1 The following information must be included for each consignment of Class 7 material, as applicable, in the order given:

a) The name or symbol of each radionuclide or, for mixtures of radionuclides, an appropriate general description or a list of the most restrictive nuclides;

b) A description of the physical and chemical form of the material, or a notation that the material is special form radioactive material or low dispersible radioactive material. A generic chemical description is acceptable for chemical form;

DGP/24-WP/3 (paragraph 3.2.16 of this report) and paragraph 2.5.1 of this report

Note.— For empty Type B(U) or Type B(M) packages as specified in the note to 2;7.2.4.1.1.7, the name or symbol of the radionuclide of the shielding material followed by the physical and chemical form must be included (e.g. U-dep., solid, metal oxide) in which case the indicated radionuclide may differ from the radionuclide(s) authorized in the package design certificate.

c) The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with an appropriate SI prefix symbol (see 1;3.2). For fissile material, the mass of fissile material (or mass of each fissile nuclide for mixtures when appropriate) in units of grams (g), or appropriate multiples thereof, may be used in place of activity;

d) The category of the package, i.e. I-WHITE, II-YELLOW, III-YELLOW;

e) The transport index (categories II-YELLOW and III-YELLOW only);

UN Model Regulations, paragraph 5.4.1.5.7.1, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.2 of this report

f) For ~~consignments including~~ fissile material ~~other than consignments excepted under 6;7.10.2, the criticality safety index;~~:

1) shipped under one exception of 2;7.2.3.5.1 a) to f), reference to that paragraph;

2) shipped under 2;7.2.3.5.1 c) to e), the total mass of fissile nuclides;

3) contained in a package for which one of 6;7.10.2 a) to c) or 6;7.10.3 is applied, reference to that paragraph; and

4) the criticality safety index, where applicable.

g) The identification mark for each competent authority certificate of approval ~~certificate~~ (special form radioactive material, low dispersible radioactive material, fissile material excepted under 2;7.2.3.5.1 f), special arrangement, package design, or shipment) applicable to the consignment;

h) For consignments of more than one package, the information contained in 4.1.4.1 a) to c) and 4.1.5.7.1 a) to g) must be given for each package. For packages in an overpack or freight container, a detailed statement of the contents of each package within the overpack or freight container and, where appropriate, of each overpack or freight container must be included. If packages are to be removed from the overpack or freight container at a point of intermediate unloading, appropriate transport documents must be made available;

i) Where a consignment is required to be shipped under exclusive use, the statement “EXCLUSIVE USE SHIPMENT”; and

j) For LSA-II, LSA-III, SCO-I and SCO-II, the total activity of the consignment as a multiple of A_2. For radioactive material for which the A_2 value is unlimited, the multiple of A_2 must be zero.

4.1.5.7.2 The shipper must provide a statement regarding actions, if any, that are required to be taken by the carrier. The statement must be in the languages deemed necessary by the carrier or the authorities concerned, and must include at least the following points:

a) Supplementary requirements for loading, stowage, carriage, handling and unloading of the package, overpack or freight container including any special stowage provisions for the safe dissipation of heat (see 7;2.10.3.2), or a statement that no such requirements are necessary;

b) Restrictions on the type of aircraft and any necessary routeing instructions;

c) Emergency arrangements appropriate to the consignment.

UN Model Regulations, paragraph 5.4.1.5.7.3, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.1 of this report

4.1.5.7.3 In all cases of international transport of packages requiring competent authorit~~ies~~y approval of design or shipment ~~approval~~, for which different approval types apply in the different countries concerned by the shipment, the UN number and proper shipping name required in 4.1.4.1 must be in accordance with the certificate of the country of origin of design.

. . .

DGP/24-WP/27 (paragraph 2.3.3 of this report) and DGP/24-WP/55 (paragraph 5.1.10 of this report)

4.1.5.8 *Additional requirements*

4.1.5.8.1 The dangerous goods transport document must also contain:

a) except for radioactive material, the packing instruction applied. For shipments of lithium batteries prepared in accordance with Section IB of Packing Instruction 965 or Packing Instruction 968, the letters “IB” must be added following the packing instruction number;

~~a~~b) ~~the packing instruction applied and,~~ when applicable, reference to Special Provision A1, ~~or~~ A2, A4 or A5~~, except for radioactive material~~;

>

~~b~~c) a statement indicating that the shipment is within the limitations prescribed for either passenger and cargo aircraft or cargo-only aircraft, as appropriate;

Note.— To qualify as acceptable for transport aboard passenger aircraft, passenger aircraft packing instruction number(s) must be used, and the package must not bear the “Cargo aircraft only” label. To qualify as acceptable for transport aboard cargo-only aircraft, cargo aircraft packing instruction number(s) must be used, and the package must bear the “Cargo aircraft only” label; or passenger aircraft instruction number(s) must be shown and no “Cargo aircraft only” label applied. However, where the packing instruction number(s) and the permitted quantity per package are identical for passenger and cargo aircraft, the “Cargo aircraft only” label should not be used.

~~c~~d) special handling information, when appropriate;

~~d~~e) an indication that an overpack has been used, when appropriate; and

~~e~~f) the “Q” value rounded up to the first decimal place, if substances are packed in accordance with 3;4.3.3 or 4;1.1.9 e).

. . .

UN Model Regulations, paragraph 5.4.1.6.1, ST/SG/AC.10/40/Add.1 and paragraph 2.5.1.3 of this report

4.1.6 Certification

4.1.6.1 The dangerous goods transport document must include a certification or declaration that the consignment is acceptable for transport and that the goods are properly packaged, marked and labelled, and in proper condition for transport in accordance with the applicable regulations and including additional air transport requirements of these Instructions (examples of additional air transport requirements are indicated in 5;1.1).

The text for this certification is:

“I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping

name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations."

For air transport the following additional statement is required:

"I declare that all of the applicable air transport requirements have been met."

The certification must be signed and dated by the shipper. Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures.

Note.— The word "placarded" is not essential for shipments by air.

4.1.6.2 If the dangerous goods documentation is presented to the operator by means of EDP or EDI transmission techniques, the signature(s) may be electronic signature(s) or may be replaced by the name(s) (in capitals) of the person authorized to sign. Where the original consignment details are provided to an operator, by EDP or EDI techniques, and subsequently the consignment is transhipped to an operator that requires a paper dangerous goods transport document, the operator must ensure the paper document indicates "Original Received Electronically" and the name of the signatory must be shown in capital letters.

4.1.6.3 In addition to the languages which may be required by the State of Origin, English should be used for the dangerous goods transport document.

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Part 6

PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS

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Chapter 2

MARKING OF PACKAGINGS OTHER THAN INNER PACKAGINGS

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2.1 MARKING REQUIREMENTS FOR PACKAGINGS OTHER THAN INNER PACKAGINGS

2.1.1 Each packaging intended for use according to these Instructions must bear markings which are durable, legible and placed in a location and of such a size relative to the packaging as to be readily visible. For packages with a gross mass of more than 30 kg the markings, or a duplicate thereof, must appear on the top or on a side of the packaging. Letters, numerals and symbols must be at least 12 mm high, except for packagings of 30 L or 30 kg capacity or less, when they must be at least 6 mm in height and for packagings of 5 L or 5 kg or less when they must be of an appropriate size. The markings must show:

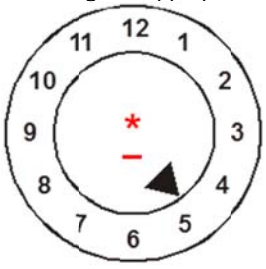
a) the United Nations packaging symbol (un)

This symbol must not be used for any purpose other than certifying that a packaging complies with the relevant requirements in Chapters 1 to 6. For embossed metal packagings the capital letters “UN” may be applied as the symbol;

. . .

UN Model Regulations, paragraph 6.1.3.1 e), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

e) the last two digits of the year during which the packaging was manufactured. Packagings of types 1H1, 1H2, 3H1 and 3H2 must also be appropriately marked with the month of manufacture; this may be marked on the packaging in a different place from the remainder of the marking. An appropriate method is:



* The last two digits of the year of manufacture may be displayed at that place. In such a case, the two digits of the year in the type approval marking and in the inner circle of the clock must be identical.

Note.— Other methods that provide the minimum required information in a durable, visible and legible form are also acceptable.

f) the State authorizing the allocation of the mark, indicated by the distinguishing sign for motor vehicles in international traffic;

g) the name of the manufacturer or other identification of the packaging specified by the appropriate national authority.

. . .

2.4 PACKAGING MARKINGS FOR INTERMEDIATE BULK CONTAINERS

. . .

UN Model Regulations, paragraph 6.5.2.2.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

2.4.3 The maximum permitted stacking load applicable when the IBC is in use must be displayed on a symbol as ~~follows~~ shown in Figure 6-1 or Figure 6-2~~:~~. The symbol must be durable and clearly visible.

Replace the symbols with the following:

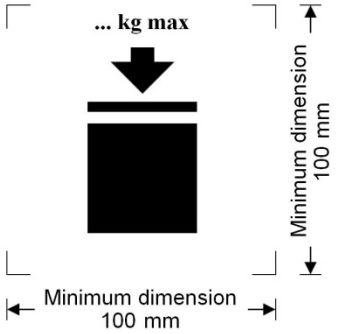


Figure 6-1. IBCs capable of being stacked

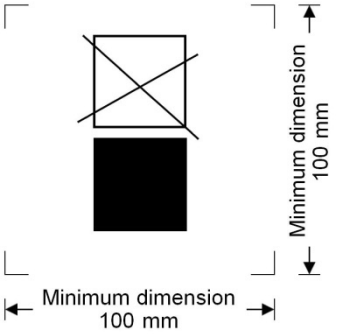


Figure 6-2. IBCs NOT capable of being stacked

The minimum dimensions must be 100 mm x 100 mm. The letters and numbers indicating the mass must be at least 12 mm high. The area within the printer's marks indicated by the dimensional arrows must be square. Where dimensions are not specified, all features must be in approximate proportion to those shown. The mass marked above the symbol must not exceed the load imposed during the design type test (see 6.5.6.6.4 of the UN Model Regulations) divided by 1.8.

Note.— The provisions of 2.4.3 must apply to all IBCs manufactured, repaired or remanufactured as from 1 January 2011. The provisions of 2.4.3 of the 2013-2014 Edition of these Instructions may continue to be applied to all IBCs manufactured, repaired or remanufactured between 1 January 2011 and 31 December 2016.

2.4.4 Example of a marking is:

(un)	13H3/Z/03 01	as in as in 2.4.2 a), b),c), and d)
	F/Meunier1713/0/1000	as in 2.4.2 e), f), g) and h)

Chapter 5

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

. . .

5.1 GENERAL REQUIREMENTS

5.1.1 Design and construction

5.1.1.1 Cylinders and closed cryogenic receptacles and their closures must be designed, manufactured, tested and equipped in such a way as to withstand all conditions, including fatigue, to which they will be subjected during normal conditions of transport.

5.1.1.2 In recognition of scientific and technological advances, and recognizing that cylinders and closed cryogenic receptacles other than those that are marked with a UN certification marking may be used on a national or regional basis, cylinders and closed cryogenic receptacles conforming to requirements other than those specified in these Instructions may be used if approved by the appropriate national authorities in the countries of transport and use.

5.1.1.3 In no case must the minimum wall thickness be less than that specified in the design and construction technical standards.

5.1.1.4 For welded cylinders and closed cryogenic receptacles, only metals of weldable quality must be used.

UN Model Regulations, paragraph 6.2.1.1.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

5.1.1.5 The test pressure of cylinders must be in accordance with Packing Instruction 200 or, for a chemical under pressure, with Packing Instruction 218. The test pressure for closed cryogenic receptacles must be in accordance with Packing Instruction 202. The test pressure of a metal hydride storage system must be in accordance with Packing Instruction 214. The test pressure of a cylinder for an adsorbed gas must be in accordance with Packing Instruction 219.

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5.2 REQUIREMENTS FOR UN CYLINDERS AND CLOSED CRYOGENIC RECEPTACLES

UN Model Regulations, paragraph 6.2.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

In addition to the general requirements of 5.1, UN cylinders and closed cryogenic receptacles must comply with the requirements of this section, including the standards, as applicable. Manufacture of new UN cylinders and closed cryogenic receptacles or service equipment according to any particular standard in 5.2.1 and 5..2.3 is not permitted after the date shown in the right hand column of the tables.

Note 1.— With the agreement of the appropriate national authority, more recently published versions of the standards, if available, may be used.

Note 2.— UN cylinders and closed cryogenic receptacles and service equipment constructed according to standards applicable at the date of manufacture may continue in use subject to the periodic inspection provisions of these Instructions.

5.2.1 Design, construction and initial inspection and testing

5.2.1.1 The following standards apply for the design, construction and initial inspection and test of UN cylinders, except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5:

UN Model Regulations, paragraph 6.2.2.1.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 9809-1:1999	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa. *Note.— The note concerning the F factor in section 7.3 of this standard must not be applied for UN cylinders.*	Until 31 December 2018
ISO 9809-1:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa	Until further notice
ISO 9809-2:2000	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1 100 MPa.	Until 31 December 2018
ISO 9809-2:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1 100 MPa	Until further notice
ISO 9809-3:2000	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders.	Until 31 December 2018
ISO 9809-3:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders	Until further notice
ISO 7866:1999	Gas cylinders — Refillable seamless aluminium alloy gas cylinders — Design, construction and testing. *Note.— The note concerning the F factor in section 7.2 of this standard must not be applied for UN cylinders. Aluminium alloy 6351A — T6 or equivalent must not be authorized.*	Until further notice
ISO 4706:2008	Gas cylinders — Refillable welded steel cylinders — Test pressure 60 bar and below.	Until further notice
ISO 18172-1:2007	Gas cylinders — Refillable welded stainless steel cylinders — Part 1: Test pressure 6 MPa and below.	Until further notice
ISO 20703:2006	Gas cylinders — Refillable welded aluminium-alloy cylinders — Design, construction and testing.	Until further notice
ISO 11118:1999	Gas cylinders — Non-refillable metallic gas cylinders — Specification and test methods.	Until further notice
ISO 11119-1:2002	Gas cylinders of composite construction — Specification and test methods — Part 1: Hoop wrapped composite gas cylinders.	Until further notice
ISO 11119-2:2002	Gas cylinders of composite construction — Specification and test methods — Part 2: Fully wrapped fibre reinforced composite gas cylinders with load-sharing metal liners.	Until further notice
ISO 11119-3:2002	Gas cylinders of composite construction — Specification and test methods — Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-load-sharing metallic or non-metallic liners.	Until further notice

Note 1.— In the above-referenced standards, composite cylinders must be designed for unlimited service life.

Note 2.— After the first 15 years of service, composite cylinders manufactured according to these standards, may be approved for extended service by the appropriate national authority which was responsible for the original approval of the cylinders and which will base its decision on the test information supplied by the manufacturer or owner or user.

5.2.1.2 Not used.

5.2.1.3 The following standards apply for the design, construction and initial inspection and test of UN acetylene cylinders except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5.

Note.— The maximum of 1 000 L volume as mentioned in the ISO standard ISO 21029-1:2004 Cryogenic vessels, does not apply for refrigerated liquefied gases in closed cryogenic receptacles installed in apparatus (e.g. MRI or cooling machines).

For the cylinder shell:

UN Model Regulations, paragraph 6.2.2.1.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 9809-1:1999	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa. *Note.— The note concerning the F factor in section 7.3 of this standard must not be applied for UN cylinders.*	Until 31 December 2018
ISO 9809-1:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa	Until further notice
ISO 9809-3:2000	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders.	Until 31 December 2018
ISO 9809-3:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 3: Normalized steel cylinders	Until further notice

For the porous mass in the cylinder:

Reference	*Title*	*Applicable for manufacture*
ISO 3807-1:2000	Cylinders for acetylene — Basic requirements — Part 1: Cylinders without fusible plugs.	Until further notice
ISO 3807-2:2000	Cylinders for acetylene — Basic requirements — Part 2: Cylinders with fusible plugs.	Until further notice

5.2.1.4 The following standard applies for the design, construction and initial inspection and test of UN closed cryogenic receptacles, except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5:

UN Model Regulations, paragraph 6.2.2.1.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 21029-1:2004	Cryogenic vessels — Transportable vacuum insulated vessels of not more than 1 000 L volume — Part 1: Design, fabrication, inspection and tests.	Until further notice

5.2.1.5 The following standards apply for the design, construction, and initial inspection and test of UN metal hydride storage systems, except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5:

UN Model Regulations, paragraph 6.2.2.1.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 16111:2008	Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride.	Until further notice

5.2.1.6 Not used.

UN Model Regulations, paragraph 6.2.2.1.7, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

5.2.1.7 The following standards apply for the design, construction and initial inspection and test of UN cylinders for adsorbed gases except that the inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5.

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 11513:2011	Gas cylinders — Refillable welded steel cylinders containing materials for sub-atmospheric gas packaging (excluding acetylene) — Design, construction, testing, use and periodic inspection	Until further notice
ISO 9809-1:2010	Gas cylinders — Refillable seamless steel gas cylinders — Design, construction and testing — Part 1: Quenched and tempered steel cylinders with tensile strength less than 1 100 MPa	Until further notice

5.2.2 Materials

In addition to the material requirements specified in the cylinder and closed cryogenic receptacle design and construction standards, and any restrictions specified in the applicable Packing Instruction for the gas(es) to be transported (e.g. Packing Instruction 200, Packing Instruction 202 or Packing Instruction 214), the following standards apply to material compatibility:

UN Model Regulations, paragraph 6.2.2.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 11114-1:~~1997~~2012	~~Transportable g~~Gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 1: Metallic materials.	Until further notice
ISO 11114-2:2000	Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 2: Non-metallic materials.	Until further notice

~~*Note.— The limitations imposed in ISO 11114-1 on high strength steel alloys at ultimate tensile strength levels up to 1 100 MPa do not apply to* **Silane** *(UN 2203).*~~

5.2.3 Service equipment

The following standards apply to closures and their protection:

UN Model Regulations, paragraph 6.2.2.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

Reference	*Title*	*Applicable for manufacture*
ISO 11117:1998	Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests	Until 31 December 2014
ISO 11117:2008+ Cor 1:2009	Gas cylinders — Valve protection caps and valve guards — Design, construction and tests. ~~*Note.— Construction according to ISO 11117:1998 may continue until 31 December 2014.*~~	Until further notice
ISO 10297:1999	Gas cylinders – Refillable gas cylinder valves – Specification and type testing	Until 31 December 2008
ISO 10297:2006	Gas cylinders — Refillable gas cylinder valves — Specification and type testing.	Until further notice
ISO 13340:2001	Transportable gas cylinders — Cylinder valves for non-refillable cylinders — Specification and prototype testing	Until further notice

For UN metal hydride storage systems, the requirements specified in the following standard apply to closures and their protection:

Reference	*Title*	*Applicable for manufacture*
ISO 16111:2008	Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride.	Until further notice

5.2.4 Periodic inspection and test

The following standards apply to the periodic inspection and testing of UN cylinders and UN metal hydride storage systems:

UN Model Regulations, paragraph 6.2.2.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

References to ISO standards are reformatted into tables with three columns, the last being new information for applicable for manufacture date.

ISO 10460:2005 was moved from last row to second.

Reference	*Title*	*Applicable for manufacture*
ISO 6406:2005	Seamless steel gas cylinders — Periodic inspection and testing.	Until further notice
ISO 10460:2005	Gas cylinders – Welded carbon-steel gas cylinders – Periodic inspection and testing. *Note.— The repair of welds described in clause 12.1 of this standard must not be permitted. Repairs described in clause 12.2 require the approval of the appropriate national authority which approved the periodic inspection and test body in accordance with 5.2.6.*	Until further notice
ISO 10461:2005/A1:2006	Seamless aluminium-alloy gas cylinders — Periodic inspection and testing.	Until further notice
ISO 10462:2005	Transportable cylinders for dissolved acetylene — Periodic inspection and maintenance.	Until further notice

ISO 11513:2011	Gas cylinders — Refillable welded steel cylinders containing materials for sub-atmospheric gas packaging (excluding acetylene) — Design, construction, testing, use and periodic inspection	Until further notice
ISO 11623:2002	Transportable gas cylinders — Periodic inspection and testing of composite gas cylinders.	Until further notice
ISO 16111:2008	Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride.	Until further notice

5.2.7 Marking of UN refillable cylinders and closed cryogenic receptacles

Note.— Marking requirements for UN metal hydride storage systems are given in 5.2.9.

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5.2.7.4 The following manufacturing marks must be applied:

m) Identification of the cylinder thread (e.g. 25E). (This mark is not required for closed cryogenic receptacles);

n) The manufacturer's mark registered by the appropriate national authority. When the country of manufacture is not the same as the country of approval, then the manufacturer's mark must be preceded by the character(s) identifying the country of manufacture, as indicated by the distinguishing signs of motor vehicles in international traffic. The country mark and the manufacturer's mark must be separated by a space or slash;

o) The serial number assigned by the manufacturer;

UN Model Regulations, paragraph 6.2.2.7.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

p) In the case of steel cylinders and closed cryogenic receptacles and composite cylinders and closed cryogenic receptacles with steel liner intended for the transport of gases with a risk of hydrogen embrittlement, the letter "H" showing compatibility of the steel (see ISO 11114-1:~~1997~~2012).

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5.2.9 Marking of UN metal hydride storage systems

5.2.9.1 UN metal hydride storage systems must be marked clearly and legibly with the marks listed in 5.2.9.2. These marks must be permanently affixed (e.g. stamped, engraved, or etched) on the metal hydride storage system. The marks must be on the shoulder, top end or neck of the metal hydride storage system or on a permanently affixed component of the metal hydride storage system. Except for the United Nations packaging symbol, the minimum size of the marks must be:

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5.2.9.2 The following marks must be applied:

a) The UN packaging symbol (u n)

This symbol must not be used for any purpose other than for certifying that a packaging complies with the relevant requirements in Chapters 1 to 6;

. . .

UN Model Regulations, paragraph 6.2.2.9.2 j), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

j) In the case of steel cylinders and composite cylinders with steel liner, the letter "H" showing compatibility of the steel (see 1SO 11114-1:~~1997~~2012); and

k) In the case of metal hydride storage systems having limited life, the date of expiry, denoted by the letters "FINAL" followed by the year (four digits), followed by the month (two digits) and separated by a slash (i.e. "/").

. . .

UN Model Regulations, paragraph 6.2.4, ST/SG/AC.10/40/Add.1 and ST/SG/AC.10/C.3/86/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

5.4 REQUIREMENTS FOR AEROSOL DISPENSERS, SMALL RECEPTACLES CONTAINING GAS (GAS CARTRIDGES) AND FUEL CELL CARTRIDGES CONTAINING LIQUEFIED FLAMMABLE GAS

~~**5.4.1 Small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas**~~

Each filled aerosol dispenser or gas cartridge or fuel cell cartridge must be subjected to a test in a hot water bath in accordance with 5.4.1 or an approved water bath alternative in accordance with 5.4.2.

UN Model Regulations, paragraph 6.2.4.1, 6.2.4.1.1, 6.2.4.1.2
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

~~**5.4.1 Small receptacles containing gas (gas cartridges) and fuel cell cartridges containing liquefied flammable gas**~~

~~5.4.1.1 Each receptacle or fuel cell cartridge must be subjected to a test performed in a hot water bath; the temperature of the bath and the duration of the test must be such that the internal pressure reaches that which would be reached at 55°C (50°C if the liquid phase does not exceed 95 per cent of the capacity of the receptacle or the fuel cell cartridge at 50°C). If the contents are sensitive to heat or if the receptacles or the fuel cell cartridges are made of plastics material which softens at this test temperature, the temperature of the bath must be set at between 20°C and 30°C but, in addition, one receptacle or fuel cell cartridge in 2 000 must be tested at the higher temperature.~~

~~5.4.1.2 No leakage or permanent deformation of a receptacle or fuel cell cartridge may occur, except that a plastic receptacle or fuel cell cartridge may be deformed through softening provided it does not leak.~~

UN Model Regulations, paragraph 6.2.4.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

~~**5.4.2 Aerosol dispensers**~~

~~5.4.2.1 Each filled aerosol dispenser must be subjected to a test performed in a hot water bath or an approved water bath alternative.~~

Heading has been reformatted:

UN Model Regulations, paragraph 6.2.4.1.1, 6.2.4.1.2 (previous 6.2.4.2.1.1, 6.2.4.2.1.2), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

~~5.4.2.2~~5.4.1 Hot water bath test

~~5.4.2.2.1~~5.4.1.1 The temperature of the water bath and the duration of the test must be such that the internal pressure reaches that which would be reached at 55°C (50°C if the liquid phase does not exceed 95 percent of the capacity of the aerosol dispenser, gas cartridge or fuel cell cartridge at 50°C). If the contents are sensitive to heat or if the aerosol dispensers, gas cartridges or fuel cell cartridges are made of plastics material which softens at this test temperature, the temperature of the bath must be set at between 20°C and 30°C but, in addition, one aerosol dispenser, gas cartridge or fuel cell cartridge in 2 000 must be tested at the higher temperature.

~~5.4.2.2.2~~5.4.1.2 No leakage or permanent deformation of an aerosol dispenser, receptacle or fuel cell cartridge may occur, except that a plastic aerosol dispenser, gas cartridge or fuel cell cartridge may be deformed through softening provided that it does not leak.

UN Model Regulations, paragraph 6.2.4.2 (previous 6.2.4.2.2), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

Heading has been reformatted:

~~5.4.2.3~~5.4.2 Alternative methods

~~5.4.2.3.1~~ With the approval of the appropriate national authority, alternative methods which provide an equivalent level of safety may be used provided that the requirements of ~~5.4.2.2.1, 5.4.2.2.2 and 5.4.2.3~~ 5.4.2.1 and, as appropriate, 5.4.2.2 or 5.4.2.3 are met.

UN Model Regulations, paragraph 6.2.4.2.1 (previous 6.2.4.2.2.1), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

~~5.4.2.3.2~~5.4.2.1 *Quality system*

~~5.4.2.3.2.1~~5.4.2.1.1 Aerosol dispenser, gas cartridge or fuel cell cartridge fillers and component manufacturers must have a quality system. The quality system must implement procedures to ensure that all aerosol dispensers, gas cartridges or fuel cell cartridges that leak or that are deformed are rejected and not offered for transport.

~~5.4.2.3.2.2~~5.4.2.1.1.1 The quality system must include:

a) a description of the organizational structure and responsibilities;

b) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;

c) quality records, such as inspection reports, test data, calibration data and certificates;

d) management reviews to ensure the effective operation of the quality system;

e) a process for control of documents and their revision;

f) a means for control of non-conforming aerosol dispensers, gas cartridges or fuel cell cartridges;

g) training programmes and qualification procedures for relevant personnel; and

h) procedures to ensure that there is no damage to the final product.

~~5.4.2.3.2.3~~5.4.2.1.1.2 An initial audit and periodic audits must be conducted to the satisfaction of the appropriate national authority. These audits must ensure the approved system is and remains adequate and efficient. Any proposed changes to the approved system must be notified to the appropriate national authority in advance.

UN Model Regulations, paragraph 6.2.4.2.2 (previous 6.2.4.2.2.2), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

5.4.2.2 *Aerosol dispensers*

~~5.4.2.3.3~~5.4.2.2.1 *Pressure and leak testing of aerosol dispensers before filling*

~~Every~~ Each empty aerosol dispenser must be subjected to a pressure equal to or in excess of the maximum expected in the filled aerosol dispensers at 55°C (50°C if the liquid phase does not exceed 95 percent of the capacity of the receptacle at 50°C). This must be at least two-thirds of the design pressure of the aerosol dispenser. If any aerosol dispenser shows evidence of leakage at a rate equal to or greater than 3.3×10^{-2} mbar.l.s^{-1} at the test pressure, distortion or other defect, it must be rejected.

UN Model Regulations, paragraph 6.2.4.2.3 (previous 6.2.4.2.2.3), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

~~5.4.2.3.4~~5.4.2.2.2 *Testing of the aerosol dispensers after filling*

~~5.4.2.3.4.1~~5.4.2.2.2.1 Prior to filling, the filler must ensure that the crimping equipment is set appropriately and the specified propellant is used.

~~5.4.2.3.4.2~~5.4.2.2.2.2 Each filled aerosol dispenser must be weighed and leak tested. The leak detection equipment must be sufficiently sensitive to detect at least a leak rate of 2.0×10^{-3} mbar.l.s^{-1} at 20°C.

~~5.4.2.3.4.3~~5.4.2.2.2.3 Any filled aerosol dispenser which shows evidence of leakage, deformation or excessive mass must be rejected.

UN Model Regulations, paragraph 6.2.4.2.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report
"Weight" was replaced with "mass" (highlighted below) post DGP-WG/13 (in line with UN text which was revised for final version of ST/SG/AC.10/40/Add.1)

5.4.2.3 *Gas cartridges and fuel cell cartridges*

5.4.2.3.1 *Pressure testing of gas cartridges and fuel cell cartridges*

5.4.2.3.1.1 Each gas cartridge or fuel cell cartridge must be subjected to a test pressure equal to or in excess of the maximum expected in the filled receptacle at 55°C (50°C if the liquid phase does not exceed 95 per cent of the capacity of the receptacle at 50°C). This test pressure must be that specified for the gas cartridge or fuel cell cartridge and must not be less than two thirds the design pressure of the gas cartridge or fuel cell cartridge. If any gas cartridge or fuel cell cartridge shows evidence of leakage at a rate equal to or greater than 3.3 x 10^{-2} mbar.l.s^{-1} at the test pressure or distortion or any other defect, it must be rejected.

5.4.2.3.2 *Leak testing gas cartridges and fuel cell cartridges*

5.4.2.3.2.1 Prior to filling and sealing, the filler must ensure that the closures (if any) and the associated sealing equipment are closed appropriately and the specified gas is used.

5.4.2.3.2.2 Each filled gas cartridge or fuel cell cartridge must be checked for the correct mass of gas and must be leak tested. The leak detection equipment must be sufficiently sensitive to detect at least a leak rate of 2.0 x 10^{-3} mbar.l.s^{-1} at 20°C.

5.4.2.3.2.3 Any gas cartridge or fuel cell cartridge that has a gas mass not in conformity with the declared mass limits or shows evidence of leakage or deformation, must be rejected.

5.4.3 With the approval of the appropriate national authority, aerosols and receptacles, small, are not subject to 5.4.1 and 5.4.2 if they are required to be sterile, but may be adversely affected by water bath testing, provided:

a) they contain a non-flammable gas and either:

   i) contain other substances that are constituent parts of pharmaceutical products for medical, veterinary or similar purposes; or

   ii) contain other substances used in the production process for pharmaceutical products; or

   iii) are used in medical, veterinary or similar applications;

b) an equivalent level of safety is achieved by the manufacturer's use of alternative methods for leak detection and pressure resistance, such as helium detection and water bathing using a statistical sample of at least 1 in 2 000 from each production batch; and

c) for pharmaceutical products according to a) i) and iii) above, they are manufactured under the authority of a national health administration. If required by the appropriate national authority, the principles of Good Manufacturing Practice (GMP) established by the World Health Organization (WHO)[1] must be followed.

1. WHO Publication: Quality assurance of pharmaceuticals. A compendium of guidelines and related materials. Volume 2: Good manufacturing practices and inspection.

Chapter 7

REQUIREMENTS FOR THE CONSTRUCTION, TESTING AND APPROVAL OF PACKAGES AND ~~MATERIAL OF CLASS 7~~ RADIOACTIVE MATERIAL

Parts of this Chapter are affected by State Variations CA 1, CA 3, CA 4, DE 2, IR 4, JP 8, JP 26, US 10; see Table A-1

7.1 GENERAL REQUIREMENTS

7.1.1 The package must be so designed in relation to its mass, volume and shape that it can be easily and safely transported. In addition, the package ~~shall~~ must be so designed that it can be properly secured in the aircraft during transport.

7.1.2 The design must be such that any lifting attachments on the package will not fail when used in the intended manner and that, if failure of the attachments should occur, the ability of the package to meet other requirements of these Instructions would not be impaired. The design must take account of appropriate safety factors to cover snatch lifting.

7.1.3 Attachments and any other features on the outer surface of the package which could be used to lift it must be designed either to support its mass in accordance with the requirements of 7.1.2 or must be removable or otherwise rendered incapable of being used during transport.

7.1.4 As far as practicable, the packaging must be designed and finished so that the external surfaces are free from protruding features and can be easily decontaminated.

7.1.5 As far as practicable, the outer layer of the package must be designed so as to prevent the collection and the retention of water.

7.1.6 Any features added to the package at the time of transport which are not part of the package must not reduce its safety.

7.1.7 The package must be capable of withstanding the effects of any acceleration, vibration or vibration resonance, which may arise under routine conditions of transport without any deterioration in the effectiveness of the closing devices on the various receptacles or in the integrity of the package as a whole. In particular, nuts, bolts and other securing devices must be designed so as to prevent them from becoming loose or being released unintentionally, even after repeated use.

7.1.8 The materials of the packaging and any components or structures must be physically and chemically compatible with each other and with the radioactive contents. Account must be taken of their behaviour under irradiation.

7.1.9 All valves through which the radioactive contents could escape must be protected against unauthorized operation.

7.1.10 The design of the package must take into account ambient temperatures and pressures that are likely to be encountered in routine conditions of transport.

UN Model Regulations, paragraph 6.4.2.11, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report
Text was deleted from the end of this paragraph post DGP-WG/13 as it is only applicable to road and rail transport.

7.1.11 A package must be so designed that it provides sufficient shielding to ensure that, under routine conditions of transport and with the maximum radioactive contents that the package is designed to contain, the radiation level at any point on the external surface of the package would not exceed the values specified in 2;7.2.4.1.1.2, 4;9.1.10 and 4;9.1.11, as applicable, with account taken of 7;2.10.3.3 c).

~~7.1.11~~7.1.12 For radioactive material having other dangerous properties, the package design must take into account those properties (see Part 2, Introductory Chapter, 3.1, 3.2 and 4;9.1.5).

7.2 ADDITIONAL REQUIREMENTS FOR PACKAGES TRANSPORTED BY AIR

7.2.1 The temperature of the accessible surfaces must not exceed 50°C at an ambient temperature of 38°C with no account taken of insolation.

7.2.2 Packages must be designed so that, if they were exposed to ambient temperatures ranging from –40°C to +55°C, the integrity of the containment would not be impaired.

UN Model Regulations, paragraph 6.4.3.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.2.3 Packages containing radioactive material must be capable of withstanding, without ~~leakage~~ loss or dispersal of radioactive contents from the containment system, an internal pressure that produces a pressure differential of not less than maximum normal operating pressure plus 95 kPa.

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UN Model Regulations, paragraph 6.4.6.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.5 REQUIREMENTS FOR PACKAGES CONTAINING URANIUM HEXAFLUORIDE

7.5.1 Packages designed to contain uranium hexafluoride must meet the requirements ~~prescribed elsewhere in these Instructions~~ which pertain to the radioactive and fissile properties of the material prescribed elsewhere in these Instructions. Except as allowed in 7.5.4, uranium hexafluoride in quantities of 0.1 kg or more must also be packaged and transported in accordance with the provisions of ISO 7195:2005: "Nuclear Energy — Packaging of uranium hexafluoride (UF_6) for transport", and the requirements of 7.5.2 and 7.5.3. The package must also meet the requirements prescribed elsewhere in these Instructions, which pertain to the radioactive and fissile properties of the material.

UN Model Regulations, paragraph 6.4.6.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.5.2 Each package designed to contain 0.1 kg or more of uranium hexafluoride must be designed so that it would meet the following requirements:

a) withstand, without leakage and without unacceptable stress, as specified in ISO 7195:2005, the structural test as specified in 7.20 except as allowed in 7.5.4;

b) withstand, without loss or dispersal of the uranium hexafluoride, the free drop test specified in 7.14.4; and

c) withstand, without rupture of the containment system, the thermal test specified in 7.16.3 except as allowed in 7.5.4.

7.5.3 Packages designed to contain 0.1 kg or more of uranium hexafluoride must not be provided with pressure relief devices.

UN Model Regulations, paragraph 6.4.6.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.5.4 Subject to the multilateral approval ~~of the competent authority~~, packages designed to contain 0.1 kg or more of uranium hexafluoride may be transported if the packages are designed:

a) ~~the packages are designed~~ to international or national standards other than ISO 7195:2005 provided an equivalent level of safety is maintained; and/or

b) ~~the packages are designed~~ to withstand, without leakage and without unacceptable stress, a test pressure of less than 2.76 MPa, as specified in 7.20; and/or

c) ~~for packages designed~~ to contain 9 000 kg or more of uranium ~~hexafluoride, the packages~~ hexafluoride and the packages do not meet the requirement of 7.5.2 c).

In all other respects, the requirements specified in 7.5.1 to 7.5.3 must be satisfied.

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7.7 REQUIREMENTS FOR TYPE B(U) PACKAGES

7.7.1 Type B(U) packages must be designed to meet the requirements specified in 7.1, 7.2 and 7.6.2 to 7.6.15, except 7.6.14 a), and, in addition, to the requirements specified in 7.7.2 to 7.7.15.

UN Model Regulations, paragraph 6.4.8.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.7.2 A package must be designed so that, under the ambient conditions specified in 7.7.5 and 7.7.6, heat generated within the package by the radioactive contents ~~shall~~ does not, under normal conditions of transport, as demonstrated by the tests in 7.14, adversely affect the package in such a way that it would fail to meet the applicable requirements for containment and shielding if left unattended for a period of one week. Particular attention ~~shall~~ must be paid to the effects of heat, which may cause one or more of the following:

a) alter the arrangement, the geometrical form or the physical state of the radioactive contents or, if the radioactive material is enclosed in a can or receptacle (for example, clad fuel elements), cause the can, receptacle or radioactive material to deform or melt; ~~or~~

b) lessen the efficiency of the packaging through differential thermal expansion or cracking or melting of the radiation shielding material; ~~or~~

c) in combination with moisture, accelerate corrosion.

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UN Model Regulations, paragraph 6.4.8.8, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.7.8 A package must be so designed that, if it were subjected to:

a) the tests specified in 7.14, it would restrict the loss of radioactive contents to not more than 10^{-6} A_2 per hour; and

b) the tests specified in 7.16.1, 7.16.2 b), 7.16.3 and 7.16.4 and either the test~~s~~ in:

i) 7.16.2 c), when the package has a mass not greater than 500 kg, an overall density not greater than 1 000 kg/m^3 based on the external dimensions, and radioactive contents greater than 1 000 A_2 not as special form radioactive material; or

ii) 7.16.2 a), for all other packages,

it would meet the following requirements:

— retain sufficient shielding to ensure that the radiation level at 1 m from the surface of the package would not exceed 10 mSv/h with the maximum radioactive contents which the package is designed to contain; and

— restrict the accumulated loss of radioactive contents in a period of one week to not more than 10 A_2 for krypton-85 and not more than A_2 for all other radionuclides.

Where mixtures of different radionuclides are present, the provisions of 2;7.2.2.4 to 2;7.2.2.6 must apply except that for krypton-85, an effective A2(i) value equal to 10 A2 may be used. For case a) above, the assessment must take into account the external contamination limits of 4;9.1.2.

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UN Model Regulations, paragraph 6.4.9.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.8 REQUIREMENTS FOR TYPE B(M) PACKAGES

Type B(M) packages must meet the requirements for Type B(U) packages specified in 7.7.1, except that for packages to be transported solely within a specified country or solely between specified countries, conditions other than those given in 7.6.5, ~~7.7.5~~7.7.4~~,~~ to 7.7.6 and 7.7.9 to 7.7.15 may be assumed with the approval of the competent authorities of these ~~countries~~States. Notwithstanding, the requirements for Type B(U) packages specified in 7.7.4 and 7.7.9 to 7.7.15 must be met as far as practicable.

7.9 REQUIREMENTS FOR TYPE C PACKAGES

7.9.1 Type C packages must be designed to meet the requirements specified in 7.1, 7.2 and 7.6.2 to 7.6.15, except as specified in 7.6.14 a), and the requirements specified in 7.7.2 to 7.7.6, 7.7.10 to 7.7.15 and 7.9.2 to 7.9.4.

7.9.2 A package must be capable of meeting the assessment criteria prescribed for tests in 7.7.8 b) and 7.7.12 after burial in an environment defined by a thermal conductivity of 0.33 W/(m.K) and a temperature of 38°C in the steady state. Initial conditions for the assessment must assume that any thermal insulation of the package remains intact, the package is at the maximum normal operating pressure and the ambient temperature is 38°C.

UN Model Regulations, paragraph 6.4.10.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.9.3 A package must be designed so that, if it were at the maximum normal operating pressure and subjected to:

a) the tests specified in 7.14, it would restrict the loss of radioactive contents to not more than 10^{-6} A_2 per hour; and

b) the test sequences in 7.19.1,~~ it~~ it would:

~~it would meet the following requirements:~~

i) retain sufficient shielding to ensure that the radiation level at 1 m from the surface of the package would not exceed 10 mSv/h with the maximum radioactive contents which the package is designed to contain; and

ii) restrict the accumulated loss of radioactive contents in a period of one week to not more than 10 A_2 for krypton-85 and not more than A_2 for all other radionuclides.

Where mixtures of different radionuclides are present, the provisions of 2;7.2.2.4 to 2;7.2.2.6 must apply, except that for krypton-85 an effective A_2(i) value equal to 10 A_2 may be used. For case a) above, the assessment must take into account the external contamination limits of 4;9.1.2.

7.9.4 A package must be so designed that there will be no rupture of the containment system following performance of the enhanced water immersion test specified in 7.17.

7.10 REQUIREMENTS FOR PACKAGES CONTAINING FISSILE MATERIAL

UN Model Regulations, paragraph 6.4.11.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraphs 2.2.1.3 and 2.6.1.1 of this report

7.10.1 Fissile material must be transported so as to:

a) maintain subcriticality during routine, normal and accident conditions of transport; in particular, the following contingencies must be considered:

i) water leaking into or out of packages;

ii) the loss of efficiency of built-in neutron absorbers or moderators;

iii) rearrangement of the contents either within the package or as a result of loss from the package;

iv) reduction of spaces within or between packages;

v) packages becoming immersed in water or buried in snow; and

vi) temperature changes; and

b) meet the requirements:

i) of 7.6.2 ~~for packages containing fissile material~~;

ii) prescribed elsewhere in these Instructions and which pertain to the radioactive properties of the material; ~~and~~

iii) ~~specified in 7.10.3 to 7.10.12~~ of 7.6.3, unless the material is excepted by ~~7.10.2~~ 2;7.2.3.5; and

iv) of 7.10.4 to 7.10.14, unless the material is excepted by 2;7.2.3.5, 7.10.2 or 7.10.3.

UN Model Regulations, paragraph 6.4.11.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.10.2 Packages containing ~~F~~fissile material that meet~~ing one of~~ the provisions ~~in~~ of subparagraph d) and one of the provisions of a) to c) below ~~a) to d) of 2;7.2.3.5 is~~ are excepted from the requirements of 7.10.4 to 7.10.14 ~~to be transported in packages that comply with 7.10.3 to 7.10.12, as well as the other requirements of these Instructions that apply to fissile material. Only one type of exception is allowed per consignment~~.

a) Packages containing fissile material in any form provided that:

i) the smallest external dimension of the package is not less than 10 cm;

ii) the criticality safety index of the package is calculated using the following formula:

$$CSI=50x5x\left(\frac{\textit{Mass of U-235 in package(g)}}{Z}\right)+\left(\frac{\textit{Mass of other fissile nuclides}^{*}\textit{ in package (g)}}{280}\right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package

where the values of Z are taken from Table 6-6.

iii) the CSI of any package does not exceed 10;

b) packages containing fissile material in any form provided that:

i) the smallest external dimension of the package is not less than 30 cm;

ii) the package, after being subjected to the tests specified in 7.14.1 to 7.14.6;

— retains its fissile material contents;

— preserves the minimum overall outside dimensions of the package to at least 30 cm;

— prevents the entry of a 10 cm cube.

iii) the criticality safety index of the package is calculated using the following formula:

$$CSI=50x2x\left(\frac{\textit{Mass of U-235 in package(g)}}{Z}\right)+\left(\frac{\textit{Mass of other fissile nuclides}^{*}\textit{ in package (g)}}{280}\right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package

where the values of Z are taken from Table 6-6.

(iv) the criticality safety index of any package does not exceed 10;

c) packages containing fissile material in any form provided that:

i) the smallest external dimension of the package is not less than 10 cm;

ii) the package, after being subjected to the tests specified in 7.14.1 to 7.14.6;

— retains its fissile material contents;

— preserves the minimum overall outside dimensions of the package to at least 10 cm;

— prevents the entry of a 10 cm cube.

iii) the CSI of the package is calculated using the following formula:

$$CSI=50x2x\left(\frac{\textit{Mass}\text{ of U-235 in package(g)}}{450}\right)+\left(\frac{\textit{Mass}\text{ of other fissile nuclides}^{*}\text{in package (g)}}{280}\right)$$

* Plutonium may be of any isotopic composition provided that the amount of Pu-241 is less than that of Pu-240 in the package

iv) the maximum mass of fissile nuclides in any package does not exceed 15 g;

d) the total mass of beryllium, hydrogenous material enriched in deuterium, graphite and other allotropic forms of carbon in an individual package must not be greater than the mass of fissile nuclides in the package except where their total concentration does not exceed 1 g in any 1 000 g of material. Beryllium incorporated in copper alloys up to 4 per cent in weight of the alloy does not need to be considered.

UN Model Regulations, paragraph Table 6.4.11.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

Table 6-6. Values of Z for calculation of criticality safety index in accordance with 7.10.2

Enrichement[a]	*Z*
Uranium enriched up to 1.5%	2200
Uranium enriched up to 5%	850
Uranium enriched up to 10%	660
Uranium enriched up to 20%	580
Uranium enriched up to 100%	450

[a] If a package contains uranium with varying enrichments of U-235, then the value corresponding to the highest enrichment must be used for Z.

UN Model Regulations, paragraph 6.4.11.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.10.3 Packages containing not more than 1 000 g of plutonium are excepted from the application of 7.10.4 to 7.4.14 provided that:

a) not more than 20 per cent of the plutonium by mass is fissile nuclides;

b) the criticality safety index of the package is calculated using the following formula:

$$CSI=50x2x\left(\frac{\textit{Mass}\text{ of plutonium (g)}}{1000}\right)$$

c) if uranium is present with the plutonium, the mass of uranium must be no more than 1 per cent of the mass of the plutonium.

UN Model Regulations, paragraphs 6.4.11.4 to 6.4.11.14, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

~~7.10.3~~7.10.4 Where the chemical or physical form, isotopic composition, mass or concentration, moderation ratio or density, or geometric configuration is not known, the assessments of ~~7.10.7~~7.10.8 to ~~7.10.12~~7.10.13 must be performed assuming that each parameter that is not known has the value which gives the maximum neutron multiplication consistent with the known conditions and parameters in these assessments.

~~7.10.4~~7.10.5 For irradiated nuclear fuel the assessments of ~~7.10.7~~7.10.8 to ~~7.10.12~~7.10.13 must be based on an isotopic composition demonstrated to provide:

a) the maximum neutron multiplic ation during the irradiation history; or

b) a conservative estimate of the neutron multiplication for the package assessments. After irradiation but prior to shipment, a measurement must be performed to confirm the conservatism of the isotopic composition.

~~7.10.5~~7.10.6 The package, after being subjected to the tests specified in 7.14, must:

a) preserve the minimum overall outside dimensions of the package to at least 10 cm; and

b) prevent the entry of a 10-cm cube.

~~7.10.6~~7.10.7 The package must be designed for an ambient temperature range of –40°C to +38°C unless the competent authority specifies otherwise in the certificate of approval for the package design.

~~7.10.7~~7.10.8 For a package in isolation, it must be assumed that water can leak into or out of all void spaces of the package, including those within the containment system. However, if the design incorporates special features to prevent such leakage of water into or out of certain void spaces, even as a result of error, absence of leakage may be assumed in respect of those void spaces. Special features must include either of the following:

a) multiple high standard water barriers not less than two of which would remain watertight if the package were subject to the tests prescribed in 7.10.~~12~~13 b), a high degree of quality control in the manufacture, maintenance and repair of packagings and tests to demonstrate the closure of each package before each shipment; or

b) for packages containing uranium hexafluoride only, with maximum enrichment of 5 mass per cent uranium-235:

i) packages where, following the tests prescribed in 7.10.~~12~~13 b), there is no physical contact between the valve and any other component of the packaging other than at its original point of attachment and where, in addition, following the test prescribed in 7.16.3, the valves remain leaktight; and

ii) a high degree of quality control in the manufacture, maintenance and repair of packagings coupled with tests to demonstrate closure of each package before each shipment.

~~7.10.8~~7.10.9 It must be assumed that the confinement system ~~must be~~ is closely reflected by at least 20 cm of water or such greater reflection as may additionally be provided by the surrounding material of the packaging. However, when it can be demonstrated that the confinement system remains within the packaging following the tests prescribed in 7.10.~~12~~.13 b), close reflection of the package by at least 20 cm of water may be assumed in 7.10.~~9~~.10 c).

~~7.10.9~~7.10.10 The package must be subcritical under the conditions of 7.10.~~7~~.8 and 7.10.~~8~~.9, with the package conditions that result in the maximum neutron multiplication consistent with:

a) routine conditions of transport (incident free);

b) the tests specified in 7.10.~~11~~.12 b);

c) the tests specified in 7.10.~~12~~.13 b).

~~7.10.10~~7.10.11:

a) The package must be subcritical under conditions consistent with the Type C package tests specified in 7.19.1 assuming reflection by at least 20 cm of water but no water-in leakage.

b) In the assessment of 7.10.~~9~~.10, allowance must not be made for special features of 7.10.~~7~~8 unless, following the Type C package tests specified in 7.19.1 and, subsequently, the water-in leakage test of 7.18.3, leakage of water into or out of the void spaces is prevented.

~~7.10.11~~7.10.12 A number "N" must be derived, such that five times "N" must be subcritical for the arrangement and package conditions that provide the maximum neutron multiplication consistent with the following:

a) There must not be anything between the packages, and the package arrangement must be reflected on all sides by at least 20 cm of water; and

b) The state of the packages must be their assessed or demonstrated condition if they had been subjected to the tests specified in 7.14.

~~7.10.12~~7.10.13 A number "N" must be derived, such that two times "N" must be subcritical for the arrangement and package conditions that provide the maximum neutron multiplication consistent with the following:

a) hydrogenous moderation between packages, and the package arrangement reflected on all sides by at least 20 cm of water; and

b) the tests specified in 7.14 followed by whichever of the following is the more limiting:

i) the tests specified in 7.16.2 b) and, either 7.16.2 c) for packages having a mass not greater than 500 kg and an overall density not greater than 1 000 kg/m^3 based on the external dimensions, or 7.16.2 a) for all other packages; followed by the test specified in 7.16.3 and completed by the tests specified in 7.18.1 to 7.18.3; or

ii) the test specified in 7.16.4; and

c) where any part of the fissile material escapes from the containment system following the tests specified in 7.10~~.12~~13 b), it must be assumed that fissile material escapes from each package in the array and all of the fissile material must be arranged in the configuration and moderation that results in the maximum neutron multiplication with close reflection by at least 20 cm of water.

~~7.10.13~~7.10.14 The criticality safety index (CSI) for packages containing fissile material must be obtained by dividing the number 50 by the smaller of the two values of N derived in 7.10~~.11~~.12 and 7.10~~.12~~.13 (i.e. CSI = 50/N). The value of the CSI may be zero, provided that an unlimited number of packages is subcritical (i.e. N is effectively equal to infinity in both cases).

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7.12 TESTING THE INTEGRITY OF THE CONTAINMENT SYSTEM AND SHIELDING AND EVALUATING CRITICALITY SAFETY

After each of the applicable tests specified in 7.14 to 7.20:

a) faults and damages must be identified and recorded;

b) it must be determined whether the integrity of the containment system and shielding has been retained to the extent required in 7.1 to 7.10 for the package under test; and

UN Model Regulations, paragraph 6.4.13 c), ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

c) it must be determined, for packages containing fissile material, whether the assumptions and conditions used in the assessments required by 7.10.1 to 7.10~~.13~~.14 for one or more packages are valid.

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7.14 TESTS FOR DEMONSTRATING ABILITY TO WITHSTAND NORMAL CONDITIONS OF TRANSPORT

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7.14.4 Free drop test: the specimen must drop onto the target so as to suffer maximum damage in respect of the safety features to be tested.

a) The height of the drop measured from the lowest point of the specimen to the upper surface of the target must be not less than the distance specified in Table 6-6 for the applicable mass. The target must be as defined in 7.13;

b) For rectangular fibreboard or wood packages not exceeding a mass of 50 kg, a separate specimen must be subjected to a free drop onto each corner from a height of 0.3 m;

c) For cylindrical fibreboard packages not exceeding a mass of 100 kg, a separate specimen must be subjected to a free drop onto each of the quarters of each rim from a height of 0.3 m.

Table ~~6-6~~ 6-7. Free drop distance for testing packages to normal conditions of transport

Package mass (kg)	*Free drop distance (m)*
Package mass < 5 000	1.2
5 000 ≤ Package mass < 10 000	0.9
10 000 ≤ Package mass < 15 000	0.6
15 000 ≤ Package mass	0.3

7.14.5 Stacking test: unless the shape of the packaging effectively prevents stacking, the specimen must be subjected, for a period of 24 hours, to a compressive load equal to the greater of the following:

UN Model Regulations, paragraph 6.4.15.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

a) the equivalent of five times ~~a total weight equal to five times~~ the maximum weight of the package; and

b) the equivalent of 13 kPa multiplied by the vertically projected area of the package.

The load must be applied uniformly to two opposite sides of the specimen, one of which must be the base on which the package would typically rest.

7.14.6 Penetration test: the specimen must be placed on a rigid, flat, horizontal surface which will not move significantly while the test is being carried out.

a) A bar of 3.2 cm in diameter with a hemispherical end and a mass of 6 kg must be dropped and directed to fall, with its longitudinal axis vertical, onto the centre of the weakest part of the specimen so that, if it penetrates sufficiently far, it will hit the containment system. The bar must not be significantly deformed by the test performance;

b) The height of the drop of the bar measured from its lower end to the intended point of impact on the upper surface of the specimen must be 1 m.

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7.16 TESTS FOR DEMONSTRATING THE ABILITY TO WITHSTAND ACCIDENT CONDITIONS IN TRANSPORT

7.16.1 The specimen must be subjected to the cumulative effects of the tests specified in 7.16.2 and 7.16.3, in that order. Following these tests, either this specimen or a separate specimen must be subjected to the effect(s) of the water immersion test(s) as specified in 7.16.4 and, if applicable, 7.17.

UN Model Regulations, paragraph 6.4.17.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.16.2 Mechanical test: the mechanical test consists of three different drop tests. Each specimen must be subjected to the applicable drops as specified in 7.7.8 or 7.10.~~12~~.13. The order in which the specimen is subjected to the drops must be such that, on completion of the mechanical test, the specimen must have suffered such damage as will lead to the maximum damage in the thermal test which follows:

a) For drop I, the specimen must drop onto the target so as to suffer the maximum damage, and the height of the drop measured from the lowest point of the specimen to the upper surface of the target must be 9 m. The target must be as defined in 7.13;

b) For drop II, the specimen must drop~~, so as to suffer the maximum damage,~~ onto a bar rigidly mounted perpendicularly on the target so as to suffer the maximum damage. The height of the drop measured from the intended point of impact of the specimen to the upper surface of the bar must be 1 m. The bar must be of solid mild steel of circular section, (15.0 ± 0.5 cm) in diameter and 20 cm long unless a longer bar would cause greater damage, in which case a bar of sufficient length to cause maximum damage must be used. The upper end of the bar

~~shall~~ must be flat and horizontal with its edge rounded off to a radius of not more than 6 mm. The target on which the bar is mounted ~~shall~~ must be as described in 7.13;

c) For drop III, the specimen must be subjected to a dynamic crush test by positioning the specimen on the target so as to suffer maximum damage by the drop of a 500 kg mass from 9 m onto the specimen. The mass must consist of a solid mild steel plate 1 m by 1 m and must fall in a horizontal attitude. The lower face of the steel plate must have its edges and corners rounded off to a radius of not more than 6 mm. The height of the drop must be measured from the underside of the plate to the highest point of the specimen. The target on which the specimen rests must be as defined in 7.13.

. . .

UN Model Regulations, paragraph 6.4.19, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.18 WATER LEAKAGE TEST FOR PACKAGES CONTAINING FISSILE MATERIAL

7.18.1 Packages for which water-in leakage or out-leakage to the extent which results in the greatest reactivity has been assumed, for purposes of assessment under 7.10.~~7~~ 8 to 7.10.~~12~~ 13, must be excepted from the test.

7.18.2 Before the specimen is subjected to the water leakage test specified below, it must be subjected to the tests in 7.16.2 b) and either 7.16.2 a) or c) as required by 7.10.~~12~~ 13 and the test specified in 7.16.3.

7.18.3 The specimen must be immersed under a head of water of at least 0.9 m for a period of not less than eight hours and in the attitude for which maximum leakage is expected.

7.19 TESTS FOR TYPE C PACKAGES

7.19.1 Specimens must be subjected to the effects of each of the following test sequences in the orders specified:

a) the tests specified in 7.16.2 a), 7.16.2 c), 7.19.2 and 7.19.3; and

b) the test specified in 7.19.4.

Separate specimens are allowed to be used for each of the sequences in a) and b).

UN Model Regulations, paragraph 6.4.20.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.19.2 Puncture/tearing test: the specimen must be subjected to the damaging effects of a vertical solid probe made of mild steel. The orientation of ~~the probe to the surface of the specimen must be positioned so~~ the package specimen and the impact point on the package surface must be such as to cause maximum damage at the conclusion of the test sequence specified in 7.19.1 a).

a) The specimen, representing a package having a mass less than 250 kg, must be placed on a target and subjected to a probe having a mass of 250 kg and falling from a height of 3 m above the intended impact point. For this test, the probe must be a 20 cm in diameter cylindrical bar with the striking end forming a frustum of a right circular cone with the following dimensions: 30 cm in height and 2.5 cm in diameter at the top with its edge rounded off to a radius of not more than 6 mm. The target on which the specimen is placed must be as specified in 7.13;

b) For packages having a mass of 250 kg or more, the base of the probe must be placed on a target and the specimen dropped onto the probe. The height of the drop, measured from the point of impact with the specimen to the upper surface of the probe must be 3 m. For this test, the probe must have the same properties and dimensions as specified in a) above, except that the length and mass of the probe must be such as to incur maximum damage to the specimen. The target on which the base of the probe is placed must be as specified in 7.13.

7.19.3 Enhanced thermal test: the conditions for this test must be as specified in 7.16.3, except that the exposure to the thermal environment must be for a period of 60 minutes.

7.19.4 Impact test: the specimen must be subject to an impact on a target at a velocity of not less than 90 m/s, at such an orientation as to suffer maximum damage. The target must be as defined in 7.13, except that the target surface may be at any orientation as long as the surface is normal to the specimen path.

7.20 TESTS FOR PACKAGINGS DESIGNED TO CONTAIN URANIUM HEXAFLUORIDE

Specimens that comprise or simulate packagings designed to contain 0.1 kg or more of uranium hexafluoride must be tested hydraulically at an internal pressure of at least 1.38 MPa but, when the test pressure is less than 2.76 MPa, the design must require multilateral approval. For re-testing packagings, any other equivalent non-destructive testing may be applied subject to multilateral approval.

7.21 APPROVALS OF PACKAGE DESIGNS AND MATERIALS

7.21.1 The approval of designs for packages containing 0.1 kg or more of uranium hexafluoride requires that:

a) each design that meets the requirements of 7.5.4 requires multilateral approval;

b) each design that meets the requirements of 7.5.1 to 7.5.3 must require unilateral approval by the competent authority of the State of Origin of the design, unless multilateral approval is otherwise required by these Instructions.

7.21.2 Each Type B(U) and Type C package design requires unilateral approval, except that:

a) a package design for fissile material, which is also subject to 5;1.2.2.1 and 7.21.4 must require multilateral approval; and

b) a Type B(U) package design for low dispersible radioactive material must require multilateral approval.

7.21.3 Each Type B(M) package design, including those for fissile material which are also subject to 5;1.2.2.1 and 7.21.4 and those for low dispersible radioactive material, must require multilateral approval.

UN Model Regulations, paragraph 6.4.22.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.21.4 Each package design for fissile material ~~that~~ which is not excepted~~, according to 7.10.2, from the requirements which apply specifically to packages containing fissile material must require multilateral approval~~ by any of the paragraphs 2;7.2.3.5.1 a) to f), 7.10.2 and 7.10.3 must require multilateral approval.

7.21.5 The design for special form radioactive material must require unilateral approval. The design for low dispersible radioactive material must require multilateral approval (see also 6.4.23.8 of the UN Recommendations).

UN Model Regulations, paragraph 6.4.22.6 and 6.4.22.7, ST/SG/AC.10/40/Add.1

7.21.6 The design for a fissile material excepted from fissile classification in accordance with 2;7.2.3.5.1 f) must require multilateral approval.

7.21.7 Alternative activity limits for an exempt consignment of instruments or articles in accordance with 2;7.2.2.2 b) must require multilateral approval.

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UN Model Regulations, paragraph 6.4.23, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (See also paragraph 3.2.3.1.1 a) and 2.6.1.2 of this report

7.22 Applications and approvals for radioactive material transport

See 6.4.23 of the UN Model Regulations.

7.~~22~~23 REGISTRATION OF SERIAL NUMBERS AND VALIDATION

7.22.1 The competent authority must be informed of the serial number of each packaging manufactured to a design approved by them. The competent authority must maintain a register of such numbers.

7.22.2 Multilateral approval may be by validation of the original certificate issued by the competent authority of the State of Origin of the design or shipment.

7.~~23~~24 TRANSITIONAL MEASURES FOR CLASS 7

7.~~23~~24.1 Packages not requiring competent authority approval of design under the 1985 and 1985 (As Amended 1990) editions of IAEA Safety Series No. 6

UN Model Regulations, paragraph 6.4.24.1, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.~~23~~24.1.1 ~~Excepted packages, Industrial packages Type IP-1, Type IP-2 and Type IP-3 and Type A packages that did not require approval of design by the competent authority and which meet the requirements of the 1985 or 1985 (As Amended 1990) editions of the IAEA *Regulations for the Safe Transport of Radioactive Material* (IAEA Safety Series No. 6) may continue to be used subject to the mandatory programme of quality assurance in accordance with the requirements of 1;6.3 and the activity limits and material restrictions of 2;7.2.4.~~ Packages not requiring competent authority approval of design (excepted packages, Type IP-1, Type IP-2, Type IP-3 and Type A packages) must meet these Instructions in full, except that packages that meet the requirements of the 1985 or 1985 (As Amended 1990) Editions of IAEA Regulations for the Safe Transport of Radioactive Material (IAEA Safety Series No.6):

a) may continue in transport provided that they were prepared for transport prior to 31 December 2003, and subject to the requirements of 7.24.4, if applicable;

b) may continue to be used provided that:

i) they were not designed to contain uranium hexafluoride;

ii) the applicable requirements of 1;6.3 of these Instructions are applied;

iii) the activity limits and classification in Part 2;7 of these Instructions are applied;

iv) the requirements and controls for transport in Parts 1, 3, 4, 5 and 7 of these Instructions are applied;

v) the packaging was not manufactured or modified after 31 December 2003.

7.~~23~~.24.1.2 Any packaging modified, unless to improve safety, or manufactured after 31 December 2003, must meet the requirements of these Instructions in full. Packages prepared for transport not later than 31 December 2003 under the 1985 or 1985 (As Amended 1990) editions of IAEA Safety Series No. 6 may continue in transport. Packages prepared for transport after this date must meet the requirements of these Instructions in full.

7.~~23~~.24.2 Packages approved under the 1973, 1973 (As Amended), 1985 and 1985 (As Amended 1990) editions of IAEA Safety Series No. 6

UN Model Regulations, paragraph 6.4.24.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.~~23~~.24.2.1 ~~Packagings manufactured to a package design approved by the competent authority under the provisions of the 1973 or 1973 (As Amended) editions of IAEA Safety Series No. 6 may continue to be used subject to: multilateral approval of package design; the mandatory programme of quality assurance in accordance with the applicable requirements of 1;6.3; the activity limits and material restrictions of 2;7.2.4; and, for a package containing fissile material and transported by air, the requirements of 7.10.10. No new manufacture of such packaging must be permitted to commence. Changes in the design of the packaging or in the nature or quantity of the authorized radioactive contents which, as determined by the competent authority, would significantly affect safety, must meet the requirements of these Instructions in full. A serial number according to the provision of 5;2.4.5.1 c) must be assigned to and marked on the outside of each packaging.~~ Packages requiring competent authority approval of the design must meet these Instructions in full unless the following conditions are met:

a) the packagings were manufactured to a package design approved by the competent authority under the provisions of the 1973 or 1973 (As Amended) or the 1985 or 1985 (As Amended 1990) Editions of IAEA Safety Series No.6);

b) the package design is subject to multilateral approval;

c) the applicable requirements of 1;6.3 of these Instructions are applied;

d) the activity limits and classification in Part 2;7 of these Instructions are applied;

e) the requirements and controls for transport in in Parts 1, 3, 4, 5 and 7 of these Instructions are applied;

f) for a package containing fissile material and transported by air, the requirement of 7.10.11 is met;

g) for packages that meet the requirements of the 1973 or 1973 (As Amended) Editions of IAEA Safety Series No. 6:

i) the packages retain sufficient shielding to ensure that the radiation level at 1 m from the surface of the package would not exceed 10 mSv/h in the accident conditions of transport defined in the 1973 Revised or 1973 Revised (As Amended) Editions of IAEA Safety Series No. 6 with the maximum radioactive contents which the package is authorized to contain;

ii) the packages do not utilize continuous venting;

iii) a serial number in accordance with the provision of 5;2.4.5.1 c) is assigned to and marked on the outside of each packaging.

UN Model Regulations, paragraph 6.4.24.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.23.24.2.2 ~~Packagings manufactured to a package design approved by the competent authority under the provisions of the 1985 or 1985 (As Amended 1990) editions of IAEA Safety Series No. 6 may continue to be used subject to the multilateral approval of package design; the mandatory programme of quality assurance in accordance with the requirements of 1;6.3; the activity limits and material restrictions of 2;7.2.4; and, for a package containing fissile material and transported by air, the requirements of 7.10.10. Changes in the design of the packaging or in the nature or quantity of the authorized radioactive contents which, as determined by the competent authority, would significantly affect safety must meet the requirements of these Instructions in full. All packagings for which manufacture begins after 31 December 2006 must meet the requirements of these Instructions in full.~~ No new manufacture of packagings to a package design meeting the provisions of the 1973, 1973 (As Amended), 1985, and 1985 (As Amended 1990) Editions of IAEA Safety Series No.6 must be permitted to commence.

UN Model Regulations, paragraph 6.4.24.4, ST/SG/AC.10/40/Add.1
Not adopted (see paragraph 2.6.1.3 of this report)

UN Model Regulations, paragraph 6.4.24.5, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.34) and paragraph 2.6.1.1 of this report

7.23.45 Special form radioactive material approved under the 1973, 1973 (As Amended), 1985 and 1985 (As Amended 1990) editions of IAEA Safety Series No. 6

Special form radioactive material manufactured to a design which had received unilateral approval by the competent authority under the 1973, 1973 (As Amended), 1985 or 1985 (As Amended 1990) editions of IAEA Safety Series No. 6 may continue to be used when in compliance with the mandatory ~~programme of quality assurance~~ management system in accordance with the applicable requirements of 1;6.3. ~~All special form radioactive material manufactured after 31 December 2003 must meet the requirements of these Instructions in full.~~No new manufacture of such special form radioactive material must be permitted to commence.

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Part 7

OPERATOR'S RESPONSIBILITIES

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Chapter 1

ACCEPTANCE PROCEDURES

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DGP/24-WP/72 (paragraph 2.7.8 of this report)

1.1 CARGO ACCEPTANCE PROCEDURES

1.1.1 Operators' acceptance staff must be adequately trained to assist them in identifying and detecting dangerous goods presented as general cargo.

1.1.2 Cargo acceptance staff should seek confirmation from shippers about the contents of any item of cargo where there are suspicions that it may contain dangerous goods, with the aim of preventing undeclared dangerous goods from being loaded on an aircraft as general cargo. Many innocuous-looking items may contain dangerous goods, and a list of general descriptions which, experience has shown, are often applied to such items is shown in Chapter 6.

Note 1.— Diamond-shaped GHS pictograms on packages may indicate the presence of dangerous goods. While some pictograms identify substances that only pose a hazard for supply and use, other GHS pictograms contain symbols that are largely equivalent to the symbols contained in the hazard labels used in transport, and which may therefore be classified as dangerous goods. For more information, see www. http://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html.

Note 2.— Often general names are used in the description of the content of a cargo shipment. To assist in the detection of undeclared dangerous goods, acceptance staff should check shipping documents with the general description stated on the air waybill and, if necessary, request documentary evidence from shippers that the shipment does not contain dangerous goods.

DGP/24-WP/2 (paragraph 3.2.26) and paragraph 2.7.1 of this report)

1.3 THE ACCEPTANCE CHECK

1.3.1 ~~An operator must not accept for transport aboard an aircraft~~ Before a consignment consisting of a package or overpack containing dangerous goods ~~or~~, a freight container containing radioactive material or a unit load device or other type of pallet containing dangerous goods as described in 1.4 ~~unless~~ is first accepted for carriage by air, the operator ~~has~~ must, by use of a checklist~~, verified~~ verify the following:

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DGP/24-WP/2 (paragraph 3.2.24) and paragraph 2.7.1.1 of this report

~~j) an overpack does not contain packages bearing the "Cargo aircraft only" label unless:~~

~~1) the packages are assembled in such a way that clear visibility and easy access to them is possible; or~~

~~2) the packages are not required to be accessible under 7;2.4.1; or~~

~~3) not more than one package is involved;~~

DGP/24-WP/2 (paragraph 3.2.26) and paragraph 2.7.1.1 of this report

Note 1.— Minor discrepancies, such as the omission of dots and commas in the proper shipping name appearing on the transport document or on package markings, or minor variations in hazard labels which do not affect the obvious meaning of

the label, are not considered as errors if they do not compromise safety and should not be considered as reason for rejecting a consignment.

Note 2.— Where packages are contained in an overpack or freight container, as permitted by 1.4, the checklist should establish the correct marking and labelling of such an overpack or other type of pallet or freight container and not the individual packages contained in them. Where packages are contained in a unit load device, as permitted by 1.4.1, the checklist should not require the checking of packages individually for the correct marking and labelling.

Note 3.— An acceptance check is not required for dangerous goods in excepted quantities and radioactive material in excepted packages.

Note 4.— Although the acceptance check required in 1.3.1 is only required to be conducted when a consignment of dangerous goods is first accepted for carriage by air, the operator of any subsequent aircraft used as part of the same journey should verify that packages, overpacks, freight containers and unit load devices continue to meet the requirements of these Instructions in respect of marking, labelling and inspection for damage.

DGP/24-WP/71 (paragraph 2.7.7 of this report)

1.4 ACCEPTANCE OF FREIGHT CONTAINERS AND UNIT LOAD DEVICES

1.4.1 An operator must not accept from a shipper a freight container or a unit load device containing dangerous goods other than:

a) a freight container for radioactive material (see 6;7.1);

b) a unit load device or other type of pallet containing consumer commodities prepared according to Packing Instruction Y963;

c) a unit load device or other type of pallet containing dry ice used as a refrigerant for other than dangerous goods prepared according to Packing Instruction 954; or

d) a unit load device or other type of pallet containing magnetized material.

1.4.2 When an operator accepts a unit load device or other type of pallet containing consumer commodities~~,~~ or dry ice ~~or magnetized material~~ as permitted by 1.4.1, the operator must attach an identification tag as required by 2.8.1 to the unit load device.

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Chapter 2

STORAGE AND LOADING

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DGP/24-WP/51 (paragraph 2.7.4 of this report)

2.8 IDENTIFICATION OF UNIT LOAD DEVICES CONTAINING DANGEROUS GOODS

2.8.1 Each unit load device containing dangerous goods which require a class hazard label must ~~clearly~~ display an identification tag on its exterior ~~an indication~~ indicating that dangerous goods are contained within the unit load device, unless those hazard class labels are themselves visible.

2.8.2 ~~This indication~~ The identification tag must ~~be provided by attaching to the unit load device an identification tag having~~

a) have a border of prominent red hatchings on both sides and be visible at all times ;

b) have ~~the~~ minimum dimensions of 148 mm × 210 mm~~.~~; and

c) be legibly marked with ~~T~~the primary and subsidiary hazard class(es) or division(s) numbers of such dangerous goods ~~must be clearly marked on this tag~~.

2.8.3 When placed inside a protective tag holder, the information on the identification tag must be legible and visible.

2.8.3~~4~~ If the unit load device contains packages bearing the “Cargo aircraft only” label, either that label must be visible or the identification tag must indicate that the unit load device can be loaded only on a cargo aircraft.

2.8.4~~5~~ The identification tag must be removed from the unit load device immediately after the dangerous goods have been unloaded.

DGP/24-WP/3 (paragraph 3.2.44) and paragraph 2.7.1.1 of this report

~~2.9 STOWAGE OF TOXIC AND INFECTIOUS SUBSTANCES~~

~~Substances of Class 6 (toxic and category A infectious substances) and substances requiring a subsidiary risk “Toxic” label must not be carried in the same compartment of an aircraft with animals, substances marked as or known to be foodstuffs, feeds or other edible substances intended for consumption by humans or by animals, unless either the toxic or category A infectious substances and the foodstuffs or animals are loaded in separate unit load devices and when stowed aboard the aircraft the unit load devices are not adjacent to each other, or the toxic or category A infectious substances are loaded in one closed unit load device and the foodstuffs or animals are loaded in another closed unit load device.~~

2.~~10~~9 SPECIAL PROVISIONS APPLICABLE TO THE CARRIAGE OF RADIOACTIVE MATERIAL

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DGP/24-WP/12 (paragraph 2.2.1.3 of this report) :

2.~~10~~9.2 Activity limits

The total activity in all aircraft, for carriage of LSA material or SCO in Type IP-1, Type IP-2, Type IP-3 ~~or unpackaged~~, must not exceed the limits shown in Table 7-5.

UN Model Regulations, paragraph 7.1.8.3.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.35) and paragraph 2.7.1.1 of this report

2.~~10~~9.3 Stowage during transport and storage in transit

2.~~10~~9.3.1 Consignments must be securely stowed.

2.~~10~~9.3.2 Provided that its average surface heat flux does not exceed 15 W/m^2 and that the immediately surrounding cargo is not in sacks or bags, a package or overpack may be carried or stored among packaged general cargo without any special stowage provisions except as may be specifically required by the competent authority in an applicable ~~approval~~ certificate of approval.

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UN Model Regulations, paragraph 7.1.8.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.35) and paragraph 2.7.1.1 of this report

2.~~10~~9.4 ~~Segregation of packages containing~~Additional requirements relating to transport and storage during transit of fissile material ~~during transport and storage in transit~~

2.~~10~~9.4.1 Any group of packages, overpacks and freight containers containing fissile material stored in transit in any one storage area must be so limited that the total sum of the criticality safety indexes in the group does not exceed 50. Each group must be stored so as to maintain a spacing of at least 6 m from other such groups.

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Renumber subsequent paragraphs accordingly.

UN Model Regulations, Table 7.1.8.3.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.35) and paragraph 2.7.1.1 of this report

Table 7-6. Transport index limits for freight containers and aircraft not under exclusive use

Type of freight container or aircraft	*Limit on total sum of transport indexes in a freight container or aboard an aircraft*
Freight container ~~— small~~	~~50~~
~~Freight container — large~~	~~50~~
Small freight container	50
Large freight container	50
Aircraft	
Passenger	50
Cargo	200

UN Model Regulations, Table 7.1.8.4.2, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.35) and paragraph 2.7.1.1 of this report

Table 7-7. Critical safety indexes limits for freight containers and aircraft containing fissile material

	Limit on total sum of criticality safety indexes in a freight container or aboard an aircraft	
Type of freight container or aircraft	*Not under exclusive use*	*Under exclusive use*
Freight container ~~— small~~	~~50~~	~~n.a.~~
~~Freight container — large~~	~~50~~	~~100~~
Small freight container	50	n.a.
Large freight container	50	100
Aircraft		
Passenger	50	n.a.
Cargo	50	100

2.~~10~~ 9.4.2 Where the total sum of the criticality safety indexes on board an aircraft or in a freight container exceeds 50, as permitted in Table 7-7, storage must be such as to maintain a spacing of at least 6 m from other groups of packages, overpacks or freight containers containing fissile material or other conveyances carrying radioactive material.

UN Model Regulations, paragraph 7.1.8.4.3, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.35) and paragraphs 2.2.1.3 and 2.7.1.1 of this report

2.9.4.3 Fissile material meeting one of the provisions a) to f) of 2;7.2.3.5.1 must meet the following requirements:

a) only one of the provisions a) to f) of 2;7.2.3.5.1 is allowed per consignment;

b) only one approved fissile material in packages classified in accordance with 2;7.2.3.5.1 f) is allowed per consignment unless multiple materials are authorized in the certificate of approval;

c) fissile material in packages classified in accordance with 2;7.2.3.5.1 c) must be transported in a consignment with no more than 45 g of fissile nuclides;

d) fissile material in packages classified in accordance with 2;7.2.3.5.1 d) must be transported in a consignment with no more than 15 g of fissile nuclides;

e) fissile material classified in accordance with 2;7.2.3.5.1 e) must be transported under exclusive use on an aircraft with no more than 45 g of fissile nuclides.

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Chapter 3

INSPECTION AND DECONTAMINATION

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3.2 DAMAGED OR LEAKING PACKAGES OF RADIOACTIVE MATERIAL, CONTAMINATED PACKAGINGS

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UN Model Regulations, paragraph 7.1.8.5.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.35) and paragraph 2.7.1.1 of this report

3.2.4 Except as provided in 3.2.5, any aircraft or equipment or part thereof which has become contaminated above the limits specified in 4;9.1.2 in the course of the transport of radioactive material, or which shows a radiation level in excess of 5 μSv/h at the surface, must be decontaminated as soon as possible by a qualified person and must not be re-used unless the following conditions are met:

a) the non-fixed contamination ~~does~~ must not exceed the limits specified in 4;9.1.2~~,~~; and

b) the radiation level resulting from the fixed contamination ~~on surfaces after decontamination is less than~~ must not exceed 5 μSv/h at the surface.

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DGP/24-WP/2 (paragraph 3.2.27) and paragraph 2.7.1.1 of this report

Chapter 4

PROVISION OF INFORMATION

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4.1 INFORMATION TO THE PILOT-IN-COMMAND

4.1.1 As early as practicable before departure of the aircraft, but in no case later than when the aircraft moves under its own power, the operator of an aircraft in which dangerous goods are to be carried must:

a) provide the pilot-in-command with accurate and legible written or printed information concerning dangerous goods that are to be carried as cargo; and

b) ~~from 1 January 2014,~~ provide personnel with responsibilities for operational control of the aircraft (e.g. the flight operations officer, flight dispatcher, or designated ground personnel responsible for flight operations) with the same information that is required to be provided to the pilot-in-command (e.g. a copy of the written information provided to the pilot-in-command). Each operator must specify the personnel (job title or function) to be provided this information in their operations manual and/or other appropriate manuals.

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Except as otherwise provided, this information must include the following:

a) the air waybill number (when issued);

b) the proper shipping name ~~(supplemented with the technical name(s) if appropriate)~~ (the technical name(s) shown on the dangerous goods transport document is not required) ~~(see 3;1)~~ and UN Number or ID number as listed in these Instructions. When chemical oxygen generators contained in protective breathing equipment (PBE) are being transported under Special Provision A144, the proper shipping name of “oxygen generator, chemical” must be supplemented with the statement “Aircrew protective breathing equipment (smoke hood) in accordance with Special Provision A144”.

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DGP/24-WP/3 (paragraph 3.2.45) and paragraph 2.7.1.1 of this report

4.1.2 For UN 1845 — **Carbon dioxide, solid** (dry ice), ~~only~~ the information required by 4.1.1 may be replaced by the UN number, proper shipping name, class, total quantity in each hold on the aircraft and the aerodrome at which the package(s) is to be unloaded ~~need to be provided~~.

4.1.3 For UN 3480 (**Lithium ion batteries**) and UN 3090 (**Lithium metal batteries**), ~~only~~ the information required by 4.1.1 may be replaced by the UN number, proper shipping name, class, total quantity at each specific loading location, and whether the package must be carried on ~~a~~ cargo aircraft only ~~aircraft need be provided~~. UN 3480 (**Lithium ion batteries**) and UN 3090 (**Lithium metal batteries**) carried under a State exemption must meet all of the requirements of 4.1.

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DGP/24-WP/3 (paragraph 3.2.6) and paragraph 2.7.1.1 of this report

4.10 TRAINING

An operator must ensure training is provided in accordance with the detailed requirements of 1;4 to all relevant employees, including those of agencies employed to act on the operator’s behalf, to enable them to carry out their responsibilities with regard to the transport of dangerous goods, passengers and their baggage, cargo and ~~,~~ mail ~~and stores~~.

DGP/24-WP/55 (paragraph 5.1.10 of this report)

4.11.1 The operator must ensure that at least one copy of the documents or information appropriate to the transport by air of a consignment of dangerous goods is retained for a minimum period of three months after the flight on which the dangerous goods were transported. As a minimum, the documents or information which must be retained are the dangerous goods transport documents, the acceptance checklist (when this is in a form which requires physical completion), the written information to the pilot-in-command ~~and, for shipments offered under Section IB of Packing Instructions 965 and 968, the alternative documentation, if applicable, or information provided on it~~. These documents or the information must be made available to the appropriate national authority upon request.

Chapter 5

PROVISIONS CONCERNING PASSENGERS AND CREW

5.1 INFORMATION TO PASSENGERS

DGP/24-WP/31 (paragraph 2.7.3 of this report)

5.1.1 An operator must ensure that information on the types of dangerous goods which a passenger is forbidden to transport aboard an aircraft is ~~provided~~ presented at the point of ticket purchase or, if this is not practical, made available in another manner to passengers prior to the check-in process. Information provided via the Internet may be in text or pictorial form but must be such that ticket purchase cannot be completed until the passenger, or a person acting on their behalf, has been presented with this information and indicated that they have understood the restrictions on dangerous goods in baggage.

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5.1.4 When provision is made for the check-in process to be completed remotely (e.g. via the Internet), the operator must ensure that information on the types of dangerous goods which a passenger is forbidden to transport aboard an aircraft is ~~provided~~ presented to passengers. Information may be in text or pictorial form but must be such that the check-in process cannot be completed until the passenger, or a person acting on their behalf, has been presented with this information and indicated that they have understood the restrictions on dangerous goods in baggage.

5.1.5 When provision is made for the check-in process to be completed at an airport by a passenger without the involvement of any other person (e.g. automated check-in facility), the operator or the airport operator must ensure that information on the types of dangerous goods which a passenger is forbidden to transport aboard an aircraft is ~~provided~~ preseented to passengers. Information should be in pictorial form and must be such that the check-in process cannot be completed until the passenger has been presented with this information and indicated that they have understood the restrictions on dangerous goods in baggage.

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Chapter 6

PROVISIONS TO AID RECOGNITION OF UNDECLARED DANGEROUS GOODS

DGP/24-WP/53 (paragraph 2.7.5 of this report)

6.1 With the aim of preventing undeclared dangerous goods from being loaded on an aircraft and of preventing passengers from taking on board those dangerous goods which they are not permitted to have in their baggage (see ~~8;1.1.2~~ Table 8-1), information about:

a) general descriptions that are often used for items in cargo or in passengers' baggage which may contain dangerous goods;

b) other indications that dangerous goods may be present (e.g. labels, markings); and

c) those dangerous goods which may be carried by passengers in accordance with ~~8;1.1.2~~ Table 8-1,

must be provided to cargo reservations and sales staff, cargo acceptance staff, passenger reservations and sales staff and passenger check-in staff as appropriate and must be readily available to such staff. The following is a list of general descriptions and the types of dangerous goods that may be included in any item bearing that description.

aircraft on ground (AOG) spares — may contain explosives (flares or other pyrotechnics), chemical oxygen generators, unserviceable tire assemblies, cylinders of compressed gas (oxygen, carbon dioxide or fire extinguishers), fuel in equipment, wet or lithium batteries, matches

automobile parts/supplies (car, motor, motorcycle) — may include engines, including fuel cell engines, carburettors or fuel tanks that contain or have contained fuel, wet or lithium batteries, compressed gases in tire inflation devices and fire extinguishers, air bags, flammable adhesives, paints, sealants and solvents, etc.

battery-powered devices/equipment — may contain wet or lithium batteries.

breathing apparatus — may indicate cylinders of compressed air or oxygen, chemical oxygen generators or refrigerated liquefied oxygen

camping equipment — may contain flammable gases (butane, propane, etc.), flammable liquids (kerosene, gasoline, etc.) or flammable solids (hexamine, matches, etc.)

cars, car parts — see automobile parts, etc.

chemicals — may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances

consolidated consignments (groupages) — may contain any of the defined classes of dangerous goods

cryogenic (liquid) — indicates refrigerated liquefied gases such as argon, helium, neon, nitrogen, etc.

cylinders — may contain compressed or liquefied gas

dental apparatus — may contain flammable resins or solvents, compressed or liquefied gas, mercury and radioactive material

diagnostic specimens — may contain infectious substances

diving equipment — may contain cylinders of compressed gas (e.g. air or oxygen). May also contain high intensity diving lamps that can generate extreme heat when operated in air. In order to be carried safely, the bulb or battery should be disconnected

drilling and mining equipment — may contain explosive(s) and/or other dangerous goods

dry shipper (vapour shipper) — may contain free liquid nitrogen. Dry shippers are not subject to these Instructions only when they do not permit the release of any free liquid nitrogen irrespective of the orientation of the packaging

electrical/electronic equipment — may contain magnetized material, mercury in switch gear, electron tubes, ~~or~~ wet or lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel

electrically powered apparatus (wheelchairs, lawnmowers, golf carts, etc.) — may contain wet or lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel

expeditionary equipment — may contain explosives (flares), flammable liquids (gasoline), flammable gas (gas for camping equipment) or other dangerous goods

film crew and media equipment — may contain explosive pyrotechnic devices, generators incorporating internal combustion engines, wet or lithium batteries, fuel, heat-producing items, etc.

frozen embryos — may be packed in refrigerated liquefied gas or dry ice

frozen fruit, vegetables, etc. — may be packed in dry ice (solid carbon dioxide)

fuel control units — may contain flammable liquids

hot-air balloon — may contain cylinders with flammable gas, fire extinguishers, engines internal combustion, batteries, etc.

household goods — may contain items meeting any of the criteria for dangerous goods. Examples include flammable liquids such as solvent-based paint, adhesives, polishes, aerosols (for passengers, those not permitted under ~~8;1.1.2~~ Table 8-1), bleach, corrosive oven or drain cleaners, ammunition, matches, etc.

instruments — may conceal barometers, manometers, mercury switches, rectifier tubes, thermometers, etc., containing mercury

laboratory/testing equipment — may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries, cylinders of compressed gas, etc.

machinery parts — may contain flammable adhesives, paints, sealants and solvents, wet and lithium batteries, mercury, cylinders of compressed or liquefied gas, etc.

magnets and other items of similar material — may individually or cumulatively meet the definition of magnetized material (see 2;9.2.1 d))

medical supplies/equipment — may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries

metal construction material — may contain ferromagnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments (see 2;9.2.1 d))

metal fencing — may contain ferromagnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments (see 2;9.2.1 d))

metal piping — may contain ferromagnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments (see 2;9.2.1 d))

passengers' baggage — may contain items meeting any of the criteria for dangerous goods~~. Examples include fireworks, flammable household liquids, corrosive oven or drain cleaners, flammable gas or liquid lighter refills or camping stove cylinders, matches, ammunition, bleach, aerosols (~~not permitted under ~~8;1.1.2~~ Table 8-1~~), etc~~.

pharmaceuticals — may contain items meeting any of the criteria for dangerous goods, particularly radioactive material, flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances

photographic supplies/equipment — may contain items meeting any of the criteria for dangerous goods, particularly heat-producing devices, flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries

racing car or motorcycle team equipment — may contain engines, including fuel cell engines, carburettors or fuel tanks that contain fuel or residual fuel, wet and lithium batteries, flammable aerosols, nitromethane or other gasoline additives, cylinders of compressed gases, etc.

refrigerators — may contain liquefied gases or an ammonia solution

repair kits — may contain organic peroxides and flammable adhesives, solvent-based paints, resins, etc.

samples for testing — may contain items meeting any of the criteria for dangerous goods, particularly infectious substances, flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances

semen — may be packed with dry ice or refrigerated liquefied gas (see also dry shipper)

ships' spares — may contain explosives (flares), cylinders of compressed gas (life rafts), paint, lithium batteries (emergency locator transmitters), etc.

sporting goods/sports team equipment — may contain cylinders of compressed or liquefied gas (air, carbon dioxide, etc.), lithium batteries, propane torches, first aid kits, flammable adhesives, aerosols, etc.

swimming pool chemicals — may contain oxidizing or corrosive substances

switches in electrical equipment or instruments — may contain mercury

tool boxes — may contain explosives (power rivets), compressed gases or aerosols, flammable gases (Butane cylinders or torches), flammable adhesives or paints, corrosive liquids, lithium batteries, etc.

torches — micro torches and utility lighters may contain flammable gas and be equipped with an electronic starter. Larger torches may consist of a torch head (often with a self-igniting switch) attached to a container or cylinder of flammable gas.

unaccompanied passengers' baggage/personal effects — may contain items meeting any of the criteria for dangerous goods. ~~Examples include fireworks, flammable household liquids, corrosive oven or drain cleaners, flammable gas or liquid lighter refills or camping stove cylinders, matches, bleach, aerosols, etc.~~ not permitted under Table 8-1.

Note.— Excess baggage carried as cargo may contain certain dangerous goods, as provided for by 1;1.1.5.1 g).

vaccines — may be packed in dry ice (solid carbon dioxide).

. . .

Part 8

PROVISIONS CONCERNING PASSENGERS AND CREW

DGP/24-WP/50 (paragraph 2.8.3 of this report)

1.1.2 Notwithstanding any additional restrictions which may be implemented by States in the interests of aviation security, except for the incident reporting provisions of 7;4.4 or 7;4.5, as applicable, the provisions of these Instructions do not apply to the ~~following~~ dangerous goods listed in Table 8-1 when carried by passengers or crew members or in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage) or in excess baggage carried as cargo as permitted by 1;1.1.5.1 g):

. . .

Table 8-1. Provisions for dangerous goods carried by passengers or crew

Items or articles	*Location*			*Approval of the operator(s) is required*	*The pilot-in-command must be informed*	*Restrictions*
	Checked baggage	*Carry-on baggage*	*On the person*			
Medical necessities						

. . .

DGP/24-WP/62 (paragraph 2.8.5 of this report)

4)	Radioisotopic cardiac pacemakers or other medical devices, including those powered by lithium batteries ~~implanted into a person~~	n/a	n/a	Yes	No	No	Must be implanted into a person or fitted externally as the result of medical treatment.
	Radio-pharmaceuticals contained within the body of a person	n/a	n/a	Yes	No	No	Must be as the result of medical treatment.

Items or articles	Location: Checked baggage	Location: Carry-on baggage	Location: On the person	Approval of the operator(s) is required	The pilot-in-command must be informed	Restrictions

. . .

DGP/24-WP/3 (paragraph 3.2.47) and paragraph 2.8.1.1 of this report

8)	Portable medical electronic devices (automated external defibrilators (AED), nebulizer, continuous positive airway pressure (CPAP), etc.) containing lithium metal or lithium ion cells or batteries	~~No~~	~~Yes~~	~~Yes~~	~~Yes~~	~~No~~	Text moved below
	Portable medical electronic devices containing lithium metal cells or batteries not exceeding 2 grams or lithium ion cells or batteries not exceeding 100 Wh	Yes	Yes	Yes	No	No	a) carried by passengers for medical use; ~~b~~d) no more than two spare batteries exceeding 2 grams lithium content for lithium metal or a watt-hour rating of 100 Wh for lithium ion may be carried by a passenger. c) ~~S~~spare batteries must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); and ~~c~~b) each installed or spare battery~~:~~ ~~———~~must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~ and~~ ~~———must not exceed the following:~~ ~~———for lithium metal batteries, a lithium content of not more than 8 grams; or~~ ~~———for lithium ion batteries, a Watt-hour rating of not more than 160 Wh.~~
	Spare batteries for portable medical electronic devices containing lithium metal cells or batteries not exceeding 2 grams or lithium ion cells or batteries not exceeding 100 Wh	No	Yes	Yes	No	No	
	Portable medical electronic devices containing lithium metal batteries exceeding 2 grams but not exceeding 8 grams or lithium ion batteries exceeding 100 Wh but not exceeding 160 Wh	Yes	Yes	Yes	Yes	No	
	Spare batteries for portable medical electronic devices containing lithium metal batteries exceeding 2 grams but not exceeding 8 grams or lithium ion batteries exceeding 100 Wh but not exceeding 160 Wh	No	Yes	Yes	Yes	No	

. . .

	Items or articles	Location: Checked baggage	Location: Carry-on baggage	Location: On the person	Approval of the operator(s) is required	The pilot-in-command must be informed	Restrictions
	Consumer articles						
. . .							
≠	17) Avalanche rescue backpack containing a cylinder of compressed gas of Division 2.2	Yes	Yes	No	Yes	No	a) no more than one per person; b) may contain a pyrotechnic trigger mechanism which must not contain more than 200 mg net of Division 1.4S; c) the backpack must be packed in such a manner that it cannot be accidentally activated; and d) the airbags within the backpack must be fitted with pressure relief valves.

DGP/24-WP/3 (paragraph 3.2.48), DGP/24-WP/2 (see paragraph 3.2.29), DGP/24-WP/49 (paragraph 2.8.2 of this report) and paragraph 2.8.1.1 of this report

Note.— The amendment in the second row of Item 18) restricting the gas to Division 2.2 without a subsidiary risk was approved and published by decision of the Council of ICAO in Addendum No. 3 to the 2013-2014 Edition of the Technical Instructions.

	18)	Small cartridges fitted into a ~~self-inflating life-jacke~~ self-inflating personal safety device such as a life-jacket or vest	Yes	Yes	Yes	Yes	No	a) no more than one personal safety device per person; b) the personal safety device must be packed in such a manner that it cannot be accidently activated; ~~a~~c) limited to carbon dioxide or another suitable gas in Division 2.2; ~~b~~d) must be for inflation purposes; ~~c~~e) the device must be fitted with no more than two small ~~cylinders of carbon dioxide or another suitable gas in Division 2.2 fitted in the life-jacket, per person~~ cartridges; and ~~d~~f) no more than two spare cartridges.
+		Small cartridges for other devices	Yes	Yes	Yes	Yes	No	a) no more than four small ~~cylinders~~ cartridges of carbon dioxide or other suitable gas in Division 2.2, without subsidiary risk, per person; and b) the water capacity of each ~~cylinder~~ cartridge must not exceed 50 mL. *Note.— For carbon dioxide, a gas ~~cylinder~~ cartridge with a water capacity of 50 mL is equivalent to a 28 g cartridge.*

	Items or articles	Location: Checked baggage	Location: Carry-on baggage	Location: On the person	Approval of the operator(s) is required	The pilot-in-command must be informed	Restrictions
DGP/24-WP/3 (paragraphs 3.5.6 and 3.2.47) and paragraph 2.8.1.1 of this report							
≠ 19)	Portable electronic devices (such as watches, calculating machines, cameras, cellular phones, laptop computers, camcorders)						
	Portable electronic devices (including medical devices) containing lithium metal or lithium ion cells or batteries (articles containing lithium metal or lithium ion cells or batteries the primary purpose of which is to provide power to another device must carried as spare batteries in accordance with the item below)	Yes	Yes	Yes	No	No	a) carried by passengers or crew for personal use; b) should be carried as carry-on baggage; c) each battery must not exceed the following: — for lithium metal batteries, a lithium content of not more than 2 grams; or — for lithium ion batteries, a Watt-hour rating of not more than 100 Wh; d) if devices are carried in checked baggage, measures must be taken to prevent unintentional activation; and e) batteries and cells must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3.
	Spare batteries for portable electronic devices (including medical devices) containing lithium metal or lithium ion cells or batteries	No	Yes	Yes	No	No	a) carried by passengers or crew for personal use; b) must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); c) each battery must not exceed the following: — for lithium metal batteries, a lithium content of not more than 2 grams; or — for lithium ion batteries, a Watt-hour rating of not more than 100 Wh; and
+							d) batteries and cells must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3.
+	Portable electronic devices containing lithium ion batteries exceeding a Watt-hour rating of 100 Wh but not exceeding 160 Wh	Yes	Yes	Yes	Yes	No	a) carried by passengers or crew for personal use; b) should be carried as carry-on baggage; and c) batteries and cells must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3.

Items or articles	Location: Checked baggage	Location: Carry-on baggage	Location: On the person	Approval of the operator(s) is required	The pilot-in-command must be informed	Restrictions
Spare batteries for portable electronic devices containing lithium ion batteries exceeding a Watt-hour rating of 100 Wh but not exceeding 160 Wh	No	Yes	Yes	Yes	No	a) carried by passengers or crew for personal use; b) no more than two individually protected spare batteries per person; c) must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g. by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); and d) batteries and cells must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3.

DGP/24-WP/2 and its Addendum (paragraph 3.2.19) and paragraph 2.8.1.1 of this report

Note.— This amendment was approved and published by decision of the Council of ICAO in Addendum No. 3 to the 2013-2014 Edition of the Technical Instructions.

20)	Fuel cells used to power portable electronic devices (for example, cameras, cellular phones, laptop computers and camcorders)	No	Yes	Yes	No	No	. . .
	Spare fuel cell cartridges	Yes	Yes	Yes	No	No	
≠							d) each fuel cell and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, and must be marked with a manufacturer's certification that it conforms to the specification. In addition, each fuel cell cartridge must be marked with the maximum quantity and type of fuel in the cartridge; . . .
≠							h) interaction between fuel cells and integrated batteries in a device must conform to IEC 62282-6-100 Ed. 1, including Amendment 1. Fuel cells whose sole function is to charge a battery in the device are not permitted;

. . .

DGP/24-WP/18 (paragraph 2.1.2.1 f) of this report)

24)	Energy efficient ~~light bulbs~~ lamps	Yes	Yes	Yes	No	No	a) when in retail packaging; and b) intended for personal or home use.

. . .

Attachment 2

GLOSSARY OF TERMS

. . .

UN Model Regulations, Appendix B, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.51) and paragraph 2.9.1 of this report

Glossary of terms

Term and explanation	*UN Number(s), when relevant*
~~**AIR BAG INFLATORS, PYROTECHNIC or AIR BAG MODULES, PYROTECHNIC or SEAT-BELT PRETENSIONERS, PYROTECHNIC**~~**SAFETY DEVICES, ELECTRICALLY INITIATED.** Articles which contain pyrotechnical substances ~~and are used as life-saving vehicle airbags or seat-belts~~ or dangerous goods of other classes and are used in vehicles, vessels or aircraft to enhance safety to persons. Examples are: air bag inflators, air bag modules, seat-belt pretensioners and pyromechanical devices. These pyromechanical devices are assembled components for tasks such as but not limited to separation, locking, or release-and-drive or occupant restraint. The term includes **Safety devices, pyrotechnic**.	0503, 3268

DGP/24-WP/3 (paragraph 3.2.13.1 d)) and paragraph 2.9.1 of this report

ASBESTOS. Asbestos is a generic name for naturally occurring mineral silicate fibres of the Serpentine and Amphibole series. In the Serpentine series is Chrysotile~~, commonly known as white asbestos~~. In the Amphibole series are Actinolite, Amosite ~~or Mysorite (commonly known as brown asbestos)~~, Anthophyllite, Crocidolite ~~(commonly known as blue asbestos)~~ and Tremolite. All types of asbestos can be hazardous to health, ~~blue and brown~~ Amphibole asbestos being the more dangerous types~~.~~	2212, 2590

Editorial Note.— Air bag inflators, air bag modules and seat belt pretensioners will be added to Table 3-1 with cross references to **Safety devices**, electrically initiated and **Safety devices, pyrotechnic.**

— — — — — — — —

ATTACHMENT A

PROPOSED AMENDMENTS TO TABLE 3-1 — UN NUMBER ORDER

The format for displaying the amendments to Table 3-1 is as follows:

Modified entries

- both the original and the modified entry are printed;
- both modified and non-modified fields are printed;
- the original entry is printed in a shaded box with an asterisk in the left margin;
- check boxes are printed above the field(s) which have been modified;
- the modified entry is shown without shading below the original entry; and
- the "≠" symbol is printed in the left margin.

Deleted entries

- deleted entries are displayed in a shaded box with an asterisk in the left margin;
- check boxes are shown above each field; and
- the ">" symbol is displayed in the left margin below the shaded box to indicate that the entry will be deleted.

New entries

New entries are shown without shading with the "+" symbol in the left margin.

Table 3-1. Dangerous Goods List

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	Actinolite, see **White asbestos**, etc.												
≠	Actinolite, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	Amosite, see **Brown asbestos**												
≠	Amosite, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	Anthophyllite, see **White asbestos**, etc.												
≠	Anthophyllite, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	Asbestos †, see **Blue asbestos** (UN No. 2212)**, Brown asbestos** (UN No. 2212) or **White asbestos** (UN No. 2590)												
≠	Asbestos †, see **Asbestos, amphibole** (UN No. 2212) or **Asbestos, chrysotile** (UN No. 2590)												
	☑												
*	Chrysotile, see **White asbestos**, etc.												
≠	Chrysotile, see **Asbestos, chrysotile** (UN 2590), etc.												
	☑												
*	Crocidolite, see **Blue asbestos**												
≠	Crocidolite, see **Asbestos, amphibole** (UN No. 2212)												

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	Mysorite, see **Brown asbestos**												
≠	Mysorite, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	Talcum with tremolite and/or actinolite, see **White asbestos,** etc.												
≠	Talcum with tremolite and/or actinolite, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	Tremolite, see **White asbestos,** etc.												
≠	Tremolite, see **Asbestos, amphibole** (UN No. 2212)												
+	Amphibole asbestos, see **Asbestos, amphibole** (UN No. 2212)												
+	Mercurous chloride, see **Mercury compound, solid, n.o.s.** (UN No. 2025)												
	☑												
*	**Ammonium nitrate** with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	0222	1.1D							FORBIDDEN		FORBIDDEN	
≠	**Ammonium nitrate**	0222	1.1D							FORBIDDEN		FORBIDDEN	
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag inflators** †	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
>													
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag modules** †	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
>													

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	**Seat-belt pretensioners †**	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
≠	**Safety devices, pyrotechnic †**	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
+	**Refrigerant gas R 1113**	1082	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
	☑												
*	**Printing ink**, flammable	1210	3		Liquid flammable		A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Printing ink**, flammable	1210	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
	☑												
*	**Printing ink related material** (including printing ink thinning or reducing compound), flammable	1210	3		Liquid flammable		A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Printing ink related material** (including printing ink thinning or reducing compound), flammable	1210	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	1263	3		Liquid flammable		☑ A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	1263	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
*	**Paint related material** (including paint thinning or reducing compound)	1263	3		Liquid flammable		☑ A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Paint related material** (including paint thinning or reducing compound)	1263	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
+	**Hay**	1327	4.1				A2 A198			FORBIDDEN		FORBIDDEN	
+	**Straw**	1327	4.1				A2 A198			FORBIDDEN		FORBIDDEN	
+	**Bhusa**	1327	4.1				A2 A198			FORBIDDEN		FORBIDDEN	
+	**Fibres, animal** burnt, wet or damp	1372	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fibres, vegetable** burnt, wet or damp	1372	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fish meal, unstabilized**	1374	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fish scrap, unstabilized**	1374	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Wool waste, wet**	1387	4.2				A2			FORBIDDEN		FORBIDDEN	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Tear gas candles**	1700	6.1	4.1	Toxic & Solid flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		679	50 kg
≠	**Tear gas candles**	1700	6.1	4.1	Toxic & Solid flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		679	50 kg
+	**Rags, oily**	1856	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Textile waste, wet**	1857	4.2				A2			FORBIDDEN		FORBIDDEN	
*	**Ammunition, toxic, non-explosive** without burster or expelling charge, non-fuzed	2016	6.1		Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		679	75 kg
≠	**Ammunition, toxic, non-explosive** without burster or expelling charge, non-fuzed	2016	6.1		Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		679	75 kg
*	**Ammunition, tear-producing, non-explosive** without burster or expelling charge, non-fuzed	2017	6.1	8	Toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		679	50 kg
≠	**Ammunition, tear-producing, non-explosive** without burster or expelling charge, non-fuzed	2017	6.1	8	Toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		679	50 kg
*	**Blue asbestos** (crocidolite) †	2212	9				A61			FORBIDDEN		FORBIDDEN	
≠	**Asbestos, amphibole*** (amosite, tremolite, actinolite, anthophyllite, crocidolite)†	2212	9				A61			FORBIDDEN		FORBIDDEN	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Brown asbestos** (amosite, mysorite) †	2212	9				A61			FORBIDDEN		FORBIDDEN	
>													
+	**Fish meal, stabilized**	2216	9				A2			FORBIDDEN		FORBIDDEN	
+	**Fish scrap, stabilized**	2216	9				A2			FORBIDDEN		FORBIDDEN	
	☑												
*	**White asbestos** (chrysotile, actinolite, anthophyllite, tremolite) †	2590	9		Miscellaneous	US 4	A61	III	E1	958	200 kg	958	200 kg
≠	**Asbestos, chrysotile** †	2590	9		Miscellaneous	US 4	A61	III	E1	958	200 kg	958	200 kg
							☑				☑		
*	**Radioactive material, excepted package – limited quantity of material**	2910	7		None		A23 A130			See Part 2;7			
≠	**Radioactive material, excepted package – limited quantity of material**	2910	7		None		A130 A193			See Part 1;6			
							☑						
*	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3066	8		Corrosive		A3 A72	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L
≠	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3066	8		Corrosive		A3 A72 A192	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L
							☑						
*	**Paint related material** (including paint thinning or reducing compound)	3066	8		Corrosive		A3 A72	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L
≠	**Paint related material** (including paint thinning or reducing compound)	3066	8		Corrosive		A3 A72 A192	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Life-saving appliances, not self-inflating** containing dangerous goods as equipment	3072	9		Miscellaneous		☑ A48 A87		E0	see 955	No limit	see 955	No limit
≠	**Life-saving appliances, not self-inflating** containing dangerous goods as equipment	3072	9		Miscellaneous		A48 A87 A182		E0	see 955	No limit	see 955	No limit
*	**Environmentally hazardous substance, solid, n.o.s.***	3077	9		Miscellaneous	CA 13 DE 5 US 4	☑ A97 A158 A179	III	E1	956 Y956	400 kg 30 kg G	956	400 kg
≠	**Environmentally hazardous substance, solid, n.o.s.***	3077	9		Miscellaneous	CA 13 DE 5 US 4	A97 A158 A179 A197	III	E1	956 Y956	400 kg 30 kg G	956	400 kg
*	**Environmentally hazardous substance, liquid, n.o.s.***	3082	9		Miscellaneous	CA 13 DE 5 US 4	☑ A97 A158	III	E1	964 Y964	450 L 30 kg G	964	450 L
≠	**Environmentally hazardous substance, liquid, n.o.s.***	3082	9		Miscellaneous	CA 13 DE 5 US 4	A97 A158 A197	III	E1	964 Y964	450 L 30 kg G	964	450 L
*	**Lithium metal batteries** (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	☑ II	E0	See 968		See 968	
≠	**Lithium metal batteries** (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183		E0	See 968		See 968	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Lithium metal batteries contained in equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A48 A99 A154 A164 A181 A185	☑ II	E0	970	5 kg	970	35 kg
≠	**Lithium metal batteries contained in equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A48 A99 A154 A164 A181 A185		E0	970	5 kg	970	35 kg
*	**Lithium metal batteries packed with equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A99 A154 A164 A181 A185	☑ II	E0	969	5 kg	969	35 kg
≠	**Lithium metal batteries packed with equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A99 A154 A164 A181 A185		E0	969	5 kg	969	35 kg
*	**Articles, pressurized, hydraulic** containing non-flammable gas	3164	2.2		Gas non-flammable		☑ A48 A114		E0	208	No limit	208	No limit
≠	**Articles, pressurized, hydraulic** containing non-flammable gas	3164	2.2		Gas non-flammable		A48 A114 A195		E0	208	No limit	208	No limit
*	**Articles, pressurized, pneumatic** containing non-flammable gas	3164	2.2		Gas non-flammable		☑ A48 A114		E0	208	No limit	208	No limit
≠	**Articles, pressurized, pneumatic** containing non-flammable gas	3164	2.2		Gas non-flammable		A48 A114 A195		E0	208	No limit	208	No limit

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag inflators** †	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119	III	E0	961	25 kg	961	100 kg
>													
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag modules** †	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119	III	E0	961	25 kg	961	100 kg
>													
	☑							☑					
*	**Seat-belt pretensioners** †	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119	III	E0	961	25 kg	961	100 kg
≠	**Safety devices**, electrically initiated†	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119		E0	961	25 kg	961	100 kg
								☑					
*	**Batteries, containing sodium** †	3292	4.3		Danger if wet		A94 A183	II	E0	FORBIDDEN		492	No limit
≠	**Batteries, containing sodium** †	3292	4.3		Danger if wet		A94 A183		E0	FORBIDDEN		492	No limit
								☑					
*	**Cells, containing sodium** †	3292	4.3		Danger if wet		A94	II	E0	492	25 kg	492	No limit
≠	**Cells, containing sodium** †	3292	4.3		Danger if wet		A94		E0	492	25 kg	492	No limit
								☑		☑			
*	**Chemical kit**	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
≠	**Chemical kit**	3316	9		Miscellaneous		A44 A163	II III	E0	960 Y960 960 Y960	10 kg 1 kg 10 kg 1 kg	960 960	10 kg 10 kg

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
								☑		☑			
*	**First aid kit**	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
≠	**First aid kit**	3316	9		Miscellaneous		A44 A163	II III	E0 E0	960 Y960 960 Y960	10 kg 1 kg 10 kg 1 kg	960 960	10 kg 10 kg
								☑					
*	**Oxygen generator, chemical †** (including when contained in associated equipment, e.g. passenger service units (PSUs), protective breathing equipment (PBE), etc.)	3356	5.1		Oxidizer	AU 1 CA 7 FR 7 IR 3 NL 1 US 3 US 18	A1 A111 A116 A144	II	E0	FORBIDDEN		565	25 kg
≠	**Oxygen generator, chemical †** (including when contained in associated equipment, e.g. passenger service units (PSUs), protective breathing equipment (PBE), etc.)	3356	5.1		Oxidizer	AU 1 CA 7 FR 7 IR 3 NL 1 US 3 US 18	A1 A111 A116 A144		E0	FORBIDDEN		565	25 kg
+	**Fumigated cargo transport unit**	3359	9							FORBIDDEN		FORBIDDEN	
+	**Fibres, vegetable, dry**	3360	4.1				A2			FORBIDDEN		FORBIDDEN	
							☑						
*	**Paint, flammable, corrosive** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3469	3	8	Liquid flammable & Corrosive		A3 A72	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
≠	**Paint, flammable, corrosive** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3469	3	8	Liquid flammable & Corrosive		A3 A72 A192	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Paint related material, flammable, corrosive** (including paint thinning or reducing compound)	3469	3	8	Liquid flammable & Corrosive		☑ A3 A72	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
≠	**Paint related material, flammable, corrosive** (including paint thinning or reducing compound)	3469	3	8	Liquid flammable & Corrosive		A3 A72 A192	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
*	**Paint, corrosive, flammable** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3470	8	3	Corrosive & Liquid flammable		☑ A72	II	E2	851 Y840	1 L 0.5 L	855	30 L
≠	**Paint, corrosive, flammable** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3470	8	3	Corrosive & Liquid flammable		A72 A192	II	E2	851 Y840	1 L 0.5 L	855	30 L
*	**Paint related material corrosive, flammable** (including paint thinning or reducing compound)	3470	8	3	Corrosive & Liquid flammable		☑ A72	II	E2	851 Y840	1 L 0.5 L	855	30 L
≠	**Paint related material corrosive, flammable** (including paint thinning or reducing compound)	3470	8	3	Corrosive & Liquid flammable		A72 A192	II	E2	851 Y840	1 L 0.5 L	855	30 L
*	**Lithium ion batteries** (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A88 A99 A154 A164 A183	☑ II	E0	See 965		See 965	
≠	**Lithium ion batteries** (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A88 A99 A154 A164 A183		E0	See 965		See 965	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Lithium ion batteries contained in equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A48 A99 A154 A164 A181 A185	II	E0	967	5 kg	967	35 kg
≠	**Lithium ion batteries contained in equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A48 A99 A154 A164 A181 A185		E0	967	5 kg	967	35 kg
*	**Lithium ion batteries packed with equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A88 A99 A154 A164 A181 A185	II	E0	966	5 kg	966	35 kg
≠	**Lithium ion batteries packed with equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A88 A99 A154 A164 A181 A185		E0	966	5 kg	966	35 kg
+	**Batteries, nickel-metal hydride**	3496	9		Miscellaneous		A199			See Part 3;3, A199			
+	**Krill meal**	3497	4.2				A2			FORBIDDEN		FORBIDDEN	
*	**Capacitor**, electric double layer (with an energy storage capacity greater than 0.3 Wh)	3499	9		Miscellaneous		A186		E0	971	No limit	971	No limit
≠	**Capacitor, electric double layer** (with an energy storage capacity greater than 0.3 Wh)	3499	9		Miscellaneous		A186		E0	971	No limit	971	No limit
*	**Mercury contained in manufactured articles**	3506	8	6.1	Corrosive & Toxic		A48 A69 A191	III	E0	869	No limit	869	No limit
≠	**Mercury contained in manufactured articles**	3506	8	6.1	Corrosive & Toxic		A48 A69 A191		E0	869	No limit	869	No limit

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
+	**Uranium hexafluoride, radioactive material, excepted package**, less than 0.1 kg per package, non-fissile or fissile-excepted	3507	8	7	Corrosive		A139 A194	I	E0	See 877		See 877	
+	**Capacitor, asymmetric** (with an energy storage capacity greater than 0.3Wh)	3508	9		Miscellaneous		A196		E0	971	No limit	971	No limit
+	**Packaging discarded, empty, uncleaned**	3509	9				A200		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, flammable, n.o.s.***	3510	2.1		Gas flammable				E0	FORBIDDEN		219	150 kg
+	**Adsorbed gas, n.o.s.***	3511	2.2		Gas non-flammable				E0	219	75 kg	219	150 kg
+	**Adsorbed gas, toxic, n.o.s.***	3512	2.3				A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, oxidizing, n.o.s.***	3513	2.2	5.1	Gas non-flammable & Oxidizer				E0	219	75 kg	219	150 kg
+	**Adsorbed gas, toxic, flammable, n.o.s.***	3514	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, oxidizing, n.o.s.***	3515	2.3	5.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, corrosive, n.o.s.***	3516	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, flammable, corrosive, n.o.s.***	3517	2.3	2.1 8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.***	3518	2.3	5.1 8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Boron trifluoride, adsorbed**	3519	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Chlorine, adsorbed**	3520	2.3	5.1 8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Silicon tetrafluoride, adsorbed**	3521	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Arsine, adsorbed**	3522	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Germane, adsorbed**	3523	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Phosphorus pentafluoride, adsorbed**	3524	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Phosphine, adsorbed**	3525	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Hydrogen selenide, adsorbed**	3526	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	

ATTACHMENT B

PROPOSED AMENDMENTS TO TABLE 3-1 — ALPHABETICAL ORDER

The format for displaying the amendments to Table 3-1 is as follows:

Modified entries

- both the original and the modified entry are printed;
- both modified and non-modified fields are printed;
- the original entry is printed in a shaded box with an asterisk in the left margin;
- check boxes are printed above the field(s) which have been modified;
- the modified entry is shown without shading below the original entry; and
- the "≠" symbol is printed in the left margin.

Deleted entries

- deleted entries are displayed in a shaded box with an asterisk in the left margin;
- check boxes are shown above each field; and
- the ">" symbol is displayed in the left margin below the shaded box to indicate that the entry will be deleted.

New entries

New entries are shown without shading with the "+" symbol in the left margin.

Table 3-1. Dangerous Goods List

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	Actinolite, see **White asbestos**, etc.												
≠	Actinolite, see **Asbestos, amphibole** (UN No. 2212)												
+	**Adsorbed gas, n.o.s.***	3511	2.2		Gas non-flammable				E0	219	75 kg	219	150 kg
+	**Adsorbed gas, flammable, n.o.s.***	3510	2.1		Gas flammable				E0	FORBIDDEN		219	150 kg
+	**Adsorbed gas, oxidizing, n.o.s.***	3513	2.2	5.1	Gas non-flammable & Oxidizer				E0	219	75 kg	219	150 kg
+	**Adsorbed gas, toxic, n.o.s.***	3512	2.3				A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, corrosive, n.o.s.***	3516	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, flammable, n.o.s.***	3514	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, flammable, corrosive, n.o.s.***	3517	2.3	2.1 8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, oxidizing, n.o.s.***	3515	2.3	5.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.***	3518	2.3	5.1 8			A2		E0	FORBIDDEN		FORBIDDEN	
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag inflators †**	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
>													
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag inflators †**	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119	III	E0	961	25 kg	961	100 kg
>													

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag modules †**	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
>													
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Air bag modules †**	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119	III	E0	961	25 kg	961	100 kg
>													
	☑												
*	**Ammonium nitrate** with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	0222	1.1D							FORBIDDEN		FORBIDDEN	
≠	**Ammonium nitrate**	0222	1.1D							FORBIDDEN		FORBIDDEN	
								☑					
*	**Ammunition, tear-producing, non-explosive** without burster or expelling charge, non-fuzed	2017	6.1	8	Toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		679	50 kg
≠	**Ammunition, tear-producing, non-explosive** without burster or expelling charge, non-fuzed	2017	6.1	8	Toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		679	50 kg
								☑					
*	**Ammunition, toxic, non-explosive** without burster or expelling charge, non-fuzed	2016	6.1		Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		679	75 kg
≠	**Ammunition, toxic, non-explosive** without burster or expelling charge, non-fuzed	2016	6.1		Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		679	75 kg

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	Amosite, see **Brown asbestos**												
≠	Amosite, see **Asbestos, amphibole** (UN No. 2212)												
+	Amphibole asbestos, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	Anthophyllite, see **White asbestos**, etc.												
≠	Anthophyllite, see **Asbestos, amphibole** (UN No. 2212)												
+	**Arsine, adsorbed**	3522	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
							☑						
*	**Articles, pressurized, hydraulic** containing non-flammable gas	3164	2.2		Gas non-flammable		A48 A114		E0	208	No limit	208	No limit
≠	**Articles, pressurized, hydraulic** containing non-flammable gas	3164	2.2		Gas non-flammable		A48 A114 A195		E0	208	No limit	208	No limit
							☑						
*	**Articles, pressurized, pneumatic** containing non-flammable gas	3164	2.2		Gas non-flammable		A48 A114		E0	208	No limit	208	No limit
≠	**Articles, pressurized, pneumatic** containing non-flammable gas	3164	2.2		Gas non-flammable		A48 A114 A195		E0	208	No limit	208	No limit
	☑												
*	Asbestos †, see **Blue asbestos** (UN No. 2212)**, Brown asbestos** (UN No. 2212) or **White asbestos** (UN No. 2590)												
≠	Asbestos †, see **Asbestos, amphibole** (UN No. 2212) or **Asbestos, chrysotile** (UN No. 2590)												
	☑												
*	**Blue asbestos** (crocidolite) †	2212	9				A61			FORBIDDEN		FORBIDDEN	
≠	**Asbestos, amphibole*** (amosite, tremolite, actinolite, anthophyllite, crocidolite)†	2212	9				A61			FORBIDDEN		FORBIDDEN	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	**White asbestos** (chrysotile, actinolite, anthophyllite, tremolite) †	2590	9		Miscellaneous	US 4	A61	III	E1	958	200 kg	958	200 kg
≠	**Asbestos, chrysotile** †	2590	9		Miscellaneous	US 4	A61	III	E1	958	200 kg	958	200 kg
								☑					
*	**Batteries, containing sodium** †	3292	4.3		Danger if wet		A94 A183	II	E0	FORBIDDEN		492	No limit
≠	**Batteries, containing sodium** †	3292	4.3		Danger if wet		A94 A183		E0	FORBIDDEN		492	No limit
+	**Batteries, nickel-metal hydride**	3496	9		Miscellaneous		A199			See Part 3;3, A199			
+	**Bhusa**	1327	4.1				A2 A198			FORBIDDEN		FORBIDDEN	
+	**Boron trifluoride, adsorbed**	3519	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
*	**Brown asbestos** (amosite, mysorite) †	2212	9				A61			FORBIDDEN		FORBIDDEN	
>													
+	**Capacitor, asymmetric** (with an energy storage capacity greater than 0.3Wh)	3508	9		Miscellaneous		A196		E0	971	No limit	971	No limit
	☑												
*	**Capacitor**, electric double layer (with an energy storage capacity greater than 0.3 Wh)	3499	9		Miscellaneous		A186		E0	971	No limit	971	No limit
≠	**Capacitor, electric double layer** (with an energy storage capacity greater than 0.3 Wh)	3499	9		Miscellaneous		A186		E0	971	No limit	971	No limit
								☑					
*	**Cells, containing sodium** †	3292	4.3		Danger if wet		A94	II	E0	492	25 kg	492	No limit
≠	**Cells, containing sodium** †	3292	4.3		Danger if wet		A94		E0	492	25 kg	492	No limit
								☑		☑			
*	**Chemical kit**	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
≠	**Chemical kit**	3316	9		Miscellaneous		A44 A163	II	E0	960 Y960	10 kg 1 kg	960	10 kg
								III		960 Y960	10 kg 1 kg	960	10 kg
+	**Chlorine, adsorbed**	3520	2.3	5.1 8			A2		E0	FORBIDDEN		FORBIDDEN	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
	☑												
*	Chrysotile, see **White asbestos**, etc.												
≠	Chrysotile, see **Asbestos, chrysotile** (UN 2590), etc.												
	☑												
*	Crocidolite, see **Blue asbestos**												
≠	Crocidolite, see **Asbestos, amphibole** (UN No. 2212)												
	☑												
*	**Environmentally hazardous substance, liquid, n.o.s.***	3082	9		Miscellaneous	CA 13 DE 5 US 4	A97 A158	III	E1	964 Y964	450 L 30 kg G	964	450 L
≠	**Environmentally hazardous substance, liquid, n.o.s.***	3082	9		Miscellaneous	CA 13 DE 5 US 4	A97 A158 A197	III	E1	964 Y964	450 L 30 kg G	964	450 L
	☑												
*	**Environmentally hazardous substance, solid, n.o.s.***	3077	9		Miscellaneous	CA 13 DE 5 US 4	A97 A158 A179	III	E1	956 Y956	400 kg 30 kg G	956	400 kg
≠	**Environmentally hazardous substance, solid, n.o.s.***	3077	9		Miscellaneous	CA 13 DE 5 US 4	A97 A158 A179 A197	III	E1	956 Y956	400 kg 30 kg G	956	400 kg
+	**Fibres, animal** burnt, wet or damp	1372	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fibres, vegetable** burnt, wet or damp	1372	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fibres, vegetable, dry**	3360	4.1				A2			FORBIDDEN		FORBIDDEN	
	☑							☑		☑			
*	**First aid kit**	3316	9		Miscellaneous		A44 A163		E0	960 Y960	10 kg 1 kg	960	10 kg
≠	**First aid kit**	3316	9		Miscellaneous		A44 A163	II III	E0 E0	960 Y960 960 Y960	10 kg 1 kg 10 kg 1 kg	960 960	10 kg 10 kg
+	**Fish meal, stabilized**	2216	9				A2			FORBIDDEN		FORBIDDEN	
+	**Fish meal, unstabilized**	1374	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fish scrap, stabilized**	2216	9				A2			FORBIDDEN		FORBIDDEN	

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
+	**Fish scrap, unstabilized**	1374	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Fumigated cargo transport unit**	3359	9							FORBIDDEN		FORBIDDEN	
+	**Germane, adsorbed**	3523	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Hay**	1327	4.1				A2 A198			FORBIDDEN		FORBIDDEN	
+	**Hydrogen selenide, adsorbed**	3526	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Krill meal**	3497	4.2				A2			FORBIDDEN		FORBIDDEN	
*	**Life-saving appliances, not self-inflating** containing dangerous goods as equipment	3072	9		Miscellaneous		☑ A48 A87		E0	see 955	No limit	see 955	No limit
≠	**Life-saving appliances, not self-inflating** containing dangerous goods as equipment	3072	9		Miscellaneous		A48 A87 A182		E0	see 955	No limit	see 955	No limit
*	**Lithium ion batteries** (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A88 A99 A154 A164 A183	☑ II	E0	See 965		See 965	
≠	**Lithium ion batteries** (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A88 A99 A154 A164 A183		E0	See 965		See 965	
*	**Lithium ion batteries contained in equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A48 A99 A154 A164 A181 A185	☑ II	E0	967	5 kg	967	35 kg
≠	**Lithium ion batteries contained in equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A48 A99 A154 A164 A181 A185		E0	967	5 kg	967	35 kg

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Lithium ion batteries packed with equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A88 A99 A154 A164 A181 A185	☑ II	E0	966	5 kg	966	35 kg
≠	**Lithium ion batteries packed with equipment** (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	A88 A99 A154 A164 A181 A185		E0	966	5 kg	966	35 kg
*	**Lithium metal batteries** (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	☑ II	E0	See 968		See 968	
≠	**Lithium metal batteries** (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183		E0	See 968		See 968	
*	**Lithium metal batteries contained in equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A48 A99 A154 A164 A181 A185	☑ II	E0	970	5 kg	970	35 kg
≠	**Lithium metal batteries contained in equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A48 A99 A154 A164 A181 A185		E0	970	5 kg	970	35 kg

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Lithium metal batteries packed with equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A99 A154 A164 A181 A185	II	E0	969	5 kg	969	35 kg
≠	**Lithium metal batteries packed with equipment** (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A99 A154 A164 A181 A185		E0	969	5 kg	969	35 kg
+	Mercurous chloride, see **Mercury compound, solid, n.o.s.** (UN No. 2025)												
*	**Mercury contained in manufactured articles**	3506	8	6.1	Corrosive & Toxic		A48 A69 A191	III	E0	869	No limit	869	No limit
≠	**Mercury contained in manufactured articles**	3506	8	6.1	Corrosive & Toxic		A48 A69 A191		E0	869	No limit	869	No limit
*	Mysorite, see **Brown asbestos**												
≠	Mysorite, see **Asbestos, amphibole** (UN No. 2212)												

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft: Packing instruction	Passenger aircraft: Max. net quantity per package	Cargo aircraft: Packing instruction	Cargo aircraft: Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Oxygen generator, chemical** † (including when contained in associated equipment, e.g. passenger service units (PSUs), protective breathing equipment (PBE), etc.)	3356	5.1		Oxidizer	AU 1 CA 7 FR 7 IR 3 NL 1 US 3 US 18	A1 A111 A116 A144	II	E0	FORBIDDEN		565	25 kg
≠	**Oxygen generator, chemical** † (including when contained in associated equipment, e.g. passenger service units (PSUs), protective breathing equipment (PBE), etc.)	3356	5.1		Oxidizer	AU 1 CA 7 FR 7 IR 3 NL 1 US 3 US 18	A1 A111 A116 A144		E0	FORBIDDEN		565	25 kg
+	**Packaging discarded, empty, uncleaned**	3509	9				A200		E0	FORBIDDEN		FORBIDDEN	
*	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	1263	3		Liquid flammable		A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	1263	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
*	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3066	8		Corrosive		A3 A72	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L
≠	**Paint** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3066	8		Corrosive		A3 A72 A192	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Paint, corrosive, flammable** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3470	8	3	Corrosive & Liquid flammable		☑ A72	II	E2	851 Y840	1 L 0.5 L	855	30 L
≠	**Paint, corrosive, flammable** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3470	8	3	Corrosive & Liquid flammable		A72 A192	II	E2	851 Y840	1 L 0.5 L	855	30 L
*	**Paint, flammable, corrosive** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3469	3	8	Liquid flammable & Corrosive		☑ A3 A72	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
≠	**Paint, flammable, corrosive** (including paint, lacquer, enamel, stain, shellac, varnish, polish, liquid filler and liquid lacquer base)	3469	3	8	Liquid flammable & Corrosive		A3 A72 A192	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
*	**Paint related material** (including paint thinning or reducing compound)	1263	3		Liquid flammable		☑ A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Paint related material** (including paint thinning or reducing compound)	1263	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
*	**Paint related material** (including paint thinning or reducing compound)	3066	8		Corrosive		☑ A3 A72	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L
≠	**Paint related material** (including paint thinning or reducing compound)	3066	8		Corrosive		A3 A72 A192	II III	E2 E1	851 Y840 852 Y841	1 L 0.5 L 5 L 1 L	855 856	30 L 60 L

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Paint related material corrosive, flammable** (including paint thinning or reducing compound)	3470	8	3	Corrosive & Liquid flammable		☑ A72	II	E2	851 Y840	1 L 0.5 L	855	30 L
≠	**Paint related material corrosive, flammable** (including paint thinning or reducing compound)	3470	8	3	Corrosive & Liquid flammable		A72 A192	II	E2	851 Y840	1 L 0.5 L	855	30 L
*	**Paint related material, flammable, corrosive** (including paint thinning or reducing compound)	3469	3	8	Liquid flammable & Corrosive		☑ A3 A72	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
≠	**Paint related material, flammable, corrosive** (including paint thinning or reducing compound)	3469	3	8	Liquid flammable & Corrosive		A3 A72 A192	I II III	E0 E2 E1	350 352 Y340 354 Y342	0.5 L 1 L 0.5 L 5 L 1 L	360 363 365	2.5 L 5 L 60 L
+	**Phosphine, adsorbed**	3525	2.3	2.1			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Phosphorus pentafluoride, adsorbed**	3524	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
*	**Printing ink**, flammable	1210	3		Liquid flammable		☑ A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Printing ink**, flammable	1210	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
*	**Printing ink related material** (including printing ink thinning or reducing compound), flammable	1210	3		Liquid flammable		☑ A3 A72	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L
≠	**Printing ink related material** (including printing ink thinning or reducing compound), flammable	1210	3		Liquid flammable		A3 A72 A192	I II III	E3 E2 E1	351 353 Y341 355 Y344	1 L 5 L 1 L 60 L 10 L	361 364 366	30 L 60 L 220 L

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
*	**Radioactive material, excepted package – limited quantity of material**	2910	7		None		A23 A130			See Part 2;7			
≠	**Radioactive material, excepted package – limited quantity of material**	2910	7		None		A130 A193			See Part 1;6			
+	**Rags, oily**	1856	4.2				A2			FORBIDDEN		FORBIDDEN	
+	**Refrigerant gas R 1113**	1082	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	**Seat-belt pretensioners** †	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119	III	E0	961	25 kg	961	100 kg
≠	**Safety devices**, electrically initiated†	3268	9		Miscellaneous	BE 3 US 16	A32 A115 A119		E0	961	25 kg	961	100 kg
*	**Seat-belt pretensioners** †	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
≠	**Safety devices, pyrotechnic** †	0503	1.4G		Explosive 1.4		A32 A56		E0	FORBIDDEN		135	75 kg
+	**Silicon tetrafluoride, adsorbed**	3521	2.3	8			A2		E0	FORBIDDEN		FORBIDDEN	
+	**Straw**	1327	4.1				A2 A198			FORBIDDEN		FORBIDDEN	
*	Talcum with tremolite and/or actinolite, see **White asbestos,** etc.												
≠	Talcum with tremolite and/or actinolite, see **Asbestos, amphibole** (UN No. 2212)												

	Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
										Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
	1	2	3	4	5	6	7	8	9	10	11	12	13
								☑					
*	**Tear gas candles**	1700	6.1	4.1	Toxic & Solid flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		679	50 kg
≠	**Tear gas candles**	1700	6.1	4.1	Toxic & Solid flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		679	50 kg
+	**Textile waste, wet**	1857	4.2				A2			FORBIDDEN		FORBIDDEN	
	☑												
*	Tremolite, see **White asbestos,** etc.												
≠	Tremolite, see **Asbestos, amphibole** (UN No. 2212)												
+	**Uranium hexafluoride, radioactive material, excepted package**, less than 0.1 kg per package, non-fissile or fissile-excepted	3507	8	7	Corrosive		A139 A194	I	E0	See 877		See 877	
+	**Wool waste, wet**	1387	4.2				A2			FORBIDDEN		FORBIDDEN	

Agenda Item 3: Development of recommendations for amendments to the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284SU) for incorporation in the 2015-2016 Edition

3.1 DRAFT AMENDMENTS TO THE SUPPLEMENT TO THE TECHNICAL INSTRUCTIONS TO ALIGN WITH THE UN RECOMMENDATIONS (DGP/24-WP/20)

3.1.1 The meeting reviewed amendments to the Supplement to the Technical Instructions to reflect the decisions taken by the UN Committee at its sixth session (Geneva, 14 December 2012). The amendments also reflected proposals agreed by DGP-WG/12 and DGP-WG/13**.**

3.1.2 A new entry for UN 3509 — **Packaging discarded, empty, uncleaned** assigned to Class 9 was introduced in the UN Model Regulations along with a new special provision permitting their use under certain conditions when they had contained dangerous goods other than radioactive material. The entry was marked as forbidden on both passenger and cargo aircraft at DGP-WG/13 on the basis that Part 4;1.1.15 required empty packagings which previously contained dangerous substances to be subject to the same requirements of the Technical Instructions as they would if the package had been filled with that substance, unless the hazard was nullified. It was noted that provisions for empty, uncleaned packagings were based on the assumption that they were still in compliance with their design type approval. The new entry was added to address a specific need to dispose or to recycle packagings which may no longer be in compliance with their design type approval.

3.1.3 Whether or not it should be added at all to the Technical Instructions was debated at DGP/24. It was suggested that the need for the entry in the Model Regulations was specific for land transport and that there was no justification to include it in the Technical Instructions. The provision had been adopted in the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) with the addition of several additional requirements. The International Maritime Organization (IMO) had similar concerns with adopting the provisions for sea transport and therefore decided to only permit UN 3509 for short sea voyages with certain extra requirements.

3.1.4 Recognizing that the panel had made a decision to include all UN numbers in the Technical Instructions regardless of whether or not they would ever be used for air transport (see paragraph 2.3.5 of the report on Agenda Item 2), UN 3509 was added to the Supplement as forbidden on both passenger and cargo aircraft. A new special provision explaining that empty un-cleaned packagings containing dangerous goods residue must be transported in the same manner as required by the Instructions for a package filled with that substance was added to Table S-3-4 and assigned to UN 3509 in Table S-3-1 (Classes 3 to 9).

3.1.5 A reference to the new Packing Instruction 219 of the Technical Instructions was added to Packing Instruction 210 of the Supplement in order to address new UN entries for adsorbed gasses. In reviewing Packing Instruction 210 it was determined that the requirements were outdated. There were several requirements in the equivalent UN packing instruction (P200) that were not included in the Supplement. It was suggested that a reference to the UN packing instruction (P200) would be more appropriate instead of repeating the requirements in Packing Instruction 210.

3.2 RECOMMENDATIONS FOR INSTRUCTORS OF DANGEROUS GOODS COURSES (DGP/24-WP/39)

3.2.1 An amendment to Part 1;4 of the Technical Instructions which would enhance the requirements for instructors of dangerous goods training was made at DGP-WG/13. There had been support for the intent of that proposal, but the overwhelming view was that the material would be more appropriate in the Supplement to the Technical Instructions as guidance material. New guidance material was developed for incorporation in the Supplement. Discussion of this proposal was deferred until the next DGP Working Group of the Whole Meeting which would take place in late 2014 (DGP-WG/14).

3.3 GUIDANCE FOR STATES WHEN INSPECTING DANGEROUS GOODS TRAINING PROGRAMMES (DGP/24-WP/77, REVISED)

3.3.1 New guidance for use by States when inspecting dangerous goods training programmes was proposed for inclusion in Chapters 5 (Inspections) and 7 (Annex 6 information relevant to State's dangerous goods responsibilities) to Part S-7. Discussion of this proposal was deferred until the next DGP Working Group of the Whole Meeting which would take place in late 2014 (DGP-WG/14).

3.4 RECOMMENDATION

3.4.1 In light of the foregoing discussions, the meeting developed the following recommendation:

Recommendation 3/1 — Amendment to the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284SU)

That the Supplement to the Technical Instructions be amended as indicated in the appendix to the report on this agenda item.

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APPENDIX

PROPOSED AMENDMENDMENTS TO THE SUPPLEMENT TO THE TECHNCIAL INSTRUCTIONS

Part S-3
DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND QUANTITY LIMITATIONS

. . .

Name	UN No.	Class or divi-sion	Sub-sidiary risk	State varia-tions	Special provi-sions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
								Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	6	7	8	9	10	11	12	13
UN Model Regulations, Chapter 3.2, Dangerous Goods List, ST/SG/AC.10/40/Add.1 and paragraph 3.1.1 of this report											
Ammonium nitrate ~~with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance~~	0222	1.1D			A326			FORBI	DDEN	FORBI	DDEN
DGP/24-WP/45, Revised (paragraph 2.3.5 of this report)											
Hay	1327	4.1			A2 A198			FORBI	DDEN	FORBI	DDEN
Straw	1327	4.1			A2 A198			FORBI	DDEN	FORBI	DDEN
Bhusa	1327	4.1			A2 A198			FORBI	DDEN	FORBI	DDEN
Fibres, animal burnt, wet or damp	1372	4.2			A2	III		FORBI	DDEN	471	100 kg
Fibres, vegetable burnt, wet or damp	1372	4.2			A2	III		FORBI	DDEN	471	100 kg
Fish meal, unstabilized	1374	4.2			A2 A327	II		FORBI	DDEN	470	50 kg
Fish scrap, unstabilized	1374	4.2			A2 A327	II		FORBI	DDEN	470	50 kg
Wool waste, wet	1387	4.2			A2	III		FORBI	DDEN	471	100 kg

Name	UN No.	Class or division	Subsidiary risk	State variations	Special provisions	UN packing group	Excepted quantity	Passenger aircraft		Cargo aircraft	
								Packing instruction	Max. net quantity per package	Packing instruction	Max. net quantity per package
1	2	3	4	6	7	8	9	10	11	12	13
Rags, oily	1856	4.2			A2			FORBI	DDEN	460	450 kg
Textile waste, wet	1857	4.2			A2	III		FORBI	DDEN	471	100 kg
Fish meal, stabilized	2216	9			A2 A327	III		FORBI	DDEN	956	200
Fish scrap, stabilized	2216	9			A2 A327	III		FORBI	DDEN	956	200
Krill meal	3497	4.2			A2 A327	II III		FORBI FORBI	DDEN DDEN	470 471	50 kg 100 kg
Fumigated cargo transport unit	3359	9			A328			FORBI	DDEN	FORBI	DDEN
Fibres, vegetable, dry	3360	4.1			A2 A48			FORBI	DDEN	460	450 kg

UN Model Regulations, Chapter 3.2, Dangerous Goods List, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.17.1 c)) and paragraphs 3.1.1, 3.1.2, 3.1.3 and 3.1.4 of this report

Packaging discarded, empty, uncleaned	3509	9			A200		E0	FORBI	DDEN	FORBI	DDEN
Adsorbed gas, flammable, n.o.s.*	3510	2.1					E0	219	(5 kg)	219	150 kg
Adsorbed gas, toxic, n.o.s.*	3512	2.3					E0	See	210	219	150 kg
Adsorbed gas, toxic, flammable, n.o.s.*	3514	2.3	2.1				E0	See	210	See	210
Adsorbed gas, toxic, oxidizing, n.o.s.*	3515	2.3	5.1				E0	See	210	See	210
Adsorbed gas, toxic, corrosive, n.o.s.*	3516	2.3	8				E0	See	210	See	210
Adsorbed gas, toxic, flammable, corrosive, n.o.s.*	3517	2.3	2.1 8				E0	See	210	See	210
Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.*	3518	2.3	5.1 8				E0	See	210	See	210

Chapter 6

SPECIAL PROVISIONS

Table S-3-4. Special Provisions

Renumber Special Provisions A200 to A225 to A300 through A325 respectively

TIs	*UN*	
UN Model Regulations, Dangerous goods list, SP370, ST/SG/AC.10/40/Add.1 and paragraph 3.1.1 of this report		
A326	(370)	This entry applies to: — ammonium nitrate with more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance; and — ammonium nitrate with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any added substance, that are not too sensitive for acceptance into Class 1 when tested in accordance with Test Series 2 (see UN *Manual of Tests and Criteria*, Part I). See also UN No. 1942.
DGP/24-WP/45 (paragraph 2.3.5 of this report)		
A327		Fish meal, fish scrap and krill meal must not be transported if their temperature at the time of loading exceeds 35 °C or 5 °C above the ambient temperature, whichever is higher.
A328		Since small amounts of toxic gases may be released from a fumigated cargo unit, the transport of these units is forbidden under any circumstances.

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Part S-4

PACKING INSTRUCTIONS

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Chapter 3

CLASS 1 — EXPLOSIVES

. . .

UN Model Regulations, paragraph 4.1.4.1, P116, PP65, ST/SG/AC.10/40/Add.1 and paragraph 3.1.1 of this report

116	PACKING INSTRUCTION 116	116

Inner packagings	*Intermediate packagings*	*Outer packagings*
Bags paper, water and oil resistant plastics textile, plastic-coated or lined woven plastics, sift-proof Receptacles fibreboard, water-resistant metal plastics wood, sift-proof Sheets paper, water-resistant paper, waxed plastics	Not necessary	Bags paper, multiwall, water-resistant (5M2) plastics, film (5H4) textile, sift-proof (5L2) textile, water-resistant (5L3) woven plastics (5H1~~/~~, 5H2~~/~~, 5H3) Boxes aluminium (4B) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with sift-proof walls (4C2) other metal (4N) plywood (4D) reconstituted wood (4F) solid plastics (4H2) steel (4A) Drums aluminium (1B1, 1B2) fibre (1G) other metal (1N1, 1N2) plastics (1H1, 1H2) steel (1A1, 1A2) Jerricans plastics (3H1, 3H2) steel (3A1, 3A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— For UN 0082, 0241, 0331 and 0332, inner packagings are not necessary if leakproof, removable head drums are used as the outer packaging.
— For UN 0082, 0241, 0331 and 0332, inner packagings are not required when the explosive is contained in a material impervious to liquid.
— For UN 0081, inner packagings are not required when contained in rigid plastic which is impervious to nitric esters.
— UN 0331, inner packagings are not required when bags (5H2), (5H3) or (5H4) are used as outer packagings.
~~— Bags (5H2 or 5H3) should be used only for UN 0082, 0241, 0331 and 0332.~~
— For UN 0081, bags must not be used as outer packagings.

UN Model Regulations, P208, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraphs 3.2.17.1 c) and 3.2.29.1 c)) and paragraph 3.1.5 of this report.

210	PACKING INSTRUCTION 210	210

The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.

Small quantities of gases in Division 2.3, including mixtures of gases, may be carried in an aircraft under the following conditions:

1. The maximum quantity of gas permitted per package must be determined using the following formula:

   Permitted mass ≤ 10^{-3} (RMM) (LC_{50})

   where:

   RMM = relative molecular mass
   LC_{50} expressed in mL/m^3 as defined in Part 2, Chapter 6 of the Technical Instructions
   Permitted mass expressed in grams.

   For mixtures of toxic gases, where the LC_{50} of the mixture or its mass per unit volume at NTP are unknown, the following formula shall be used to determine the permitted mass of the mixture:

$$\frac{\text{mass of component 1}}{10^{-3}\,(\text{RMM})_1(\text{LC}_{50})_1} + \frac{\text{mass of component 2}}{10^{-3}\,(\text{RMM})_2(\text{LC}_{50})_2} + \frac{\text{mass of component } n}{10^{-3}\,(\text{RMM})_n(\text{LC}_{50})_n} \leq 1$$

   where:

   NTP is normal temperature and pressure
   (RMM) = relative molecular mass of component 1 ... *n*

   This latter formula makes no allowance for any synergistic effect of the mixture and it should not be used where the toxic effects are other than additive.

2. The gas must be contained in a gas cylinder which meets the requirements of Packing Instruction 200, [Packing Instruction 219 for adsorbed gases] or an IP.8 glass ampoule, provided it is compatible with the gas.

   The maximum quantity of gas permitted in a glass ampoule is determined by the above formula but is further limited to not more than 100 g.

3. The glass ampoule or gas cylinder must be tightly packed as to prevent movement in an outer metal pressure vessel containing inert absorbent and cushioning material. The outer metal pressure vessels must be designed to contain the total quantity of gas in case of leakage of the ampoule or cylinder. The outer metal pressure vessel must meet the requirements of Packing Instruction 200. Special care must be taken to prevent corrosion of the inner wall of the outer metal pressure vessels.

4. The outer metal pressure vessel must be tightly packed, so as to prevent movement, in a strong ~~outside~~ outer packaging.

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Chapter 6

CLASS 4 — FLAMMABLE SOLIDS; SUBSTANCES LIABLE TO SPONTANEOUS COMBUSTION; SUBSTANCES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES

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DGP/24-WP/45 (paragraph 2.3.5 of this report)

Packing Instruction 460

Cargo aircraft only for UN 1856 and UN 3360 only

General requirements

Part 4, Chapter 1 requirements must be met, including:

1) **Compatibility requirements**

— Substances must be compatible with their packagings as required by 4;1.1.3.

2) **Closure requirements**

— Closures must meet the requirements of 4;1.1.4.

UN number and proper shipping name	*Total quantity per package — cargo*
UN 1856 **Rags, oily**	450 kg
UN 3360 **Fibres, vegetable, dry**	450 kg

OUTER PACKAGINGS

Strong outer packaging

— — — — — — — —

Agenda Item 4: Development of recommendations for amendments to the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481) for incorporation in the 2015-2016 Edition

4.1 DRAFT AMENDMENTS TO THE EMERGENCY RESPONSE GUIDANCE FOR AIRCRAFT INCIDENTS INVOLVING DANGEROUS GOODS (DGP/24-WP/21)

4.1.1 The meeting reviewed amendments to the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481) to reflect the decisions taken by the UN Committee at its at its sixth session (Geneva, 14 December 2012). The amendments were agreed.

4.2 UPDATE TO PROCEDURES FOR CABIN CREW TO ADDRESS CABIN INCIDENTS INVOLVING LITHIUM BATTERIES (DGP/24-WP/38, ADDENDA/CORRIGENDA NOS. 1 AND 2)

4.2.1 The meeting was invited to consider incorporating new guidance material developed by the IATA Cabin Safety Task Force on dealing with events after an incident involving a lithium battery fire in the passenger cabin into Doc 9481. The material:

a) expanded on current guidance to include a lithium battery overheating or an electrical smell emitting from a portable electronic device;

b) expanded on current guidance to include when and how to safely move the device once the fire is extinguished. The decision to expand this was prompted by operators who had sought guidance on what to do once the device was extinguished until the first point of landing; and

c) included offloading procedures for a device involved in a lithium battery event.

4.2.2 It was noted that an ICAO Cabin Safety Group (ICSG) had recently developed dangerous goods training material for the *ICAO Cabin Crew Safety Training Manual* (Doc 7192) which included competency frameworks for cabin crew duties and responsibilities related to dangerous goods. A working group which included representation from that group along with technical officers from the Flight Operations Section (OPS) met during DGP/24 to review the amendments proposed. A revised proposal, which included a splitting of the checklists into three separate lists to specifically address fires related to general dangerous goods, fires involving portable electronic devices, and spills involving dangerous goods was agreed, pending a review through correspondence by members of the ICSG and the Operations Panel (OPSP).

4.3 REVISION TO THE DRILL CODE FOR LITHIUM ION BATTERIES (DGP/24-WP/76)

4.3.1 An amendment to replace drill code “9Z” with “9F” for all lithium ion battery entries was proposed. Drill code “9F” had been replaced with “9Z” for all lithium ion and lithium metal battery entries in the 2013-2014 Edition of the Emergency Response Guidance. Drill letter “Z” advises that the aircraft cargo fire suppression system may not extinguish or contain a fire and to consider landing immediately. It was noted that although Halon was shown to be ineffective in suppressing a lithium metal fire, it was effective in suppressing a lithium ion fire and preventing the spread of fire to adjacent combustible material. It was suggested that lithium ion fires were similar to flammable fires and therefore drill code “9F” would be more appropriate.

4.3.2 Although some believed “9Z” should remain, the majority agreed that “9F” was more appropriate. Those in support of the amendment believed it would facilitate transport and provide comfort to the flight crew in knowing they had batteries on board that could be dealt with in the event of a fire. Those that did not support it believed that in not having a “Z” letter assigned, the recommendation to use water would be lost and that this would be a disadvantage if the type of batteries were unknown and they were in fact lithium metal. It was noted, however, that the drill codes were primarily intended for incidents in cargo and that separate guidance for incidents in the cabin was contained in Section 3 of the Emergency Response Guide.

4.3.3 During the discussion, the panel was reminded of results of testing in one State that demonstrated the behaviour of a burning lithium cell was very dependent on the chemistry, size and design of the cell. While the effectiveness of Halon was known to be positive for lithium ion batteries most commonly transported, the same level of effectiveness could not be guaranteed for all types of batteries and that further testing was needed.

4.3.4 The amendment was agreed. The panel recommended that the amendment be incorporated in the 2013-2014 Edition of the *Emergency Response Guidance* by way of an addendum as it addressed a safety risk.

4.4 RECOMMENDATION

4.4.1 In light of the foregoing discussion, the meeting developed the following recommendation:

> **Recommendation 4/1 — Amendment to the *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481)**
>
> That the *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481) be amended as indicated in the appendix to the report on this agenda item.

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APPENDIX

PROPOSED AMENDMENTS TO THE *EMERGENCY RESPONSE GUIDANCE FOR AIRCRAFT INCIDENTS INVOLVING DANGEROUS GOODS*

Section 3

EXAMPLES OF DANGEROUS GOODS INCIDENTS CHECKLISTS

…

DGP/24-WP/38, Addendum/Corrigendum No. 2 (see paragraph 4.2 of the report on this agenda item)

Replace Section 3.3 with the following:

3.3 CABIN CREW CHECKLIST FOR DANGEROUS GOODS INCIDENTS IN THE PASSENGER CABIN DURING FLIGHT

IN CASE OF FIRE INVOLVING BATTERIES / PORTABLE ELECTRONIC DEVICES (PED)

***IMMEDIATE* ACTION**

- Notify pilot-in-command
- Identify the item
- Apply appropriate fire-fighting procedure / obtain and use fire extinguisher / consider use of personal protective equipment (PPE) as applicable to the situation
- Disconnect from power supply, if applicable
- Douse device with water (or other non-flammable liquid) to cool cells and prevent ignition of adjacent cells
  Note.— Liquid may turn to steam when applied to the hot battery
- Move passengers away from the area
- Turn off in-seat power, if applicable,
- Monitor for any re-ignition. If smoke re-appears, continue using water (or other non-flammable liquid).
- Verify that power to remaining electrical outlets remains off until the aircraft's system can be determined to be free of faults, if the device was previously plugged in

Warning:

- Do not attempt to remove battery from device
- Do not touch, pick up or attempt to move a device that is burning or emitting smoke or an electrical smell. Batteries can explode or burst into flames without warning

- Do not cover or enclose the device as it could cause it to overheat: Do not use ice or dry ice to cool the device

In case of fire / smoke in overhead bin

- Fire in an overhead bin and the device is visible and accessible: apply the above procedures
- Device is contained in baggage and flames are visible: apply above procedures
- No flames visible: remove bag from overhead bin. Apply appropriate fire-fighting procedures, then douse with water (or other non-flammable liquid), if available place in suitable container and continue to douse with water

Warning:

Do not open bag when there is any indication of smoke or flame

WHEN DEVICE HAS COOLED

- Monitor device for 10-15 minute period, after which time the device (or baggage containing device) may be moved, using available PPE, **only if** there is no evidence of smoke or heat
- Place the device (or baggage) in a suitable container and completely immerse the device in water (or other non-flammable liquid)
- Secure selected container to prevent spillage
- Monitor the device and the surrounding area for the remainder of the flight

Overheat or electrical smell involving a PED:

- Instruct passenger or crew member to turn off the device immediately
- Disconnect from power supply, if applicable
- Turn off in-seat power, if applicable,
- Verify that device remains off for the duration of the flight
- Keep device visible and monitor closely
  Note.— Unstable batteries may ignite even after device is turned off.

AFTER LANDING – POST INCIDENT OFFLOADING PROCEDURES

- Complete required documentation
- Identify to ground personnel PED and where stowed
- Make appropriate entry in maintenance log

IN CASE OF FIRE INVOLVING DANGEROUS GOODS:

***IMMEDIATE* ACTION**

- Notify pilot-in-command
- Identify the item
- Apply the appropriate fire-fighting procedure / check use of water
- Move passengers away from the area
- Monitor for any re-ignition. If smoke re-appears, continue applying appropriate fire-fighting procedure

In case of fire / smoke in overhead bin

- If a fire occurs in an overhead bin and the fire is visible and accessible, apply the above procedure
- If the fire is from baggage and flames are visible, apply above procedure
- If there are no flames visible, remove bag from overhead bin. Apply appropriate fire-fighting procedures / check use of water

Warning:

Do not open bag when there is any indication of smoke or flame

AFTER LANDING – POST INCIDENT OFFLOADING PROCEDURES

- Complete required documentation
- Identify to ground personnel dangerous goods item and where stowed
- Make appropriate entry in maintenance log

IN CASE OF SPILLAGE OR LEAKAGE OF DANGEROUS GOODS:

***IMMEDIATE* ACTION**

- Notify pilot-in-command
- Identify the item

- Collect emergency response kit or other useful items
- Don rubber gloves and smoke hood
- Move passengers away from area and distribute wet towels or cloths
- Place dangerous goods item in polyethylene bags
- Stow polyethylene bags
- Treat affected seat cushions / covers in the same manner as dangerous goods item
- Cover spillage on carpet / floor
- Regularly inspect items stowed away / contaminated furnishings

AFTER LANDING – POST INCIDENT OFFLOADING PROCEDURES

- Complete required documentation
- Identify to ground personnel dangerous goods item and where stowed
- Make appropriate entry in maintenance log

3.4 AMPLIFIED CABIN CREW CHECKLIST FOR DANGEROUS GOODS INCIDENTS IN THE PASSENGER CABIN DURING FLIGHT

IN CASE OF FIRE INVOLVING BATTERIES / PORTABLE ELECTRONIC DEVICE (PED)

IMMEDIATE ACTION

NOTIFY PILOT-IN-COMMAND

Any incident concerning a fire in the cabin should be notified immediately to the pilot-in-command who should be kept informed of all actions taken and of the effect. It is essential that the cabin crew and the flight crew coordinate their actions and that each be kept fully informed of the other's actions and intentions.

Important:
Minimizing the spreading of smoke and fumes into the flight deck is critical for the continued safe operation of the aircraft, therefore it is essential to keep the flight deck door closed at all times. Crew communication and coordination is of utmost importance. The use of the interphone is the primary means of communication unless the interphone system fails.

IDENTIFY THE ITEM

Ask the passenger concerned to identify the item.

On aircraft with only one cabin crew member, consult with the pilot-in-command as to whether the aid of a passenger should be sought in dealing with the incident.

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DISCONNECT FROM POWER SUPPLY (IF APPLICABLE)

A battery has a higher likelihood of catching fire due to overheating during or immediately following a charging cycle, although the effects may be delayed for some period of time. By removing external power from the device, it will be assured that additional energy is not being fed to the battery to promote a fire.

DOUSE DEVICE WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

It is essential that water (or other non-flammable liquid) is used to cool a battery that has ignited to prevent the spread of heat to other cells in the battery. If water is not available, any non-flammable liquid may be used to cool the cells and device.
(*Note.— Liquid may turn to steam when applied to the hot battery.*)

MOVE PASSENGERS AWAY FROM THE AREA

Cabin crew should take prompt action if fire develops to move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions for passengers to breathe through them.

TURN OFF IN-SEAT POWER (IF APPLICABLE)

Turn off the in-seat power to the remaining electrical outlets until it can be assured that a malfunctioning aircraft system does not contribute to additional failures of the passengers' portable electronic devices.

MONITOR FOR ANY RE-IGNITION. IF SMOKE/FLAMES RE-APPEARS, CONTINUE USING WATER (OR OTHER NON-FLAMMABLE LIQUID)

A battery involved in a fire can reignite and emit flames multiple times as heat is transferred to other cells in the battery. Therefore the device must be monitored regularly to identify if there is any indication that a fire risk may still exist. If there is any smoke or indication of fire the device must be doused with more water (or other non-flammable liquid).

VERIFY THAT POWER TO REMAINING OUTLETS REMAINS OFF

Verify that power to remaining electrical outlets remains off until the aircraft's system can be determined to be free of faults, if the device was previously plugged in.

WARNING:

Do not attempt to remove the battery from the device;

Do not handle device; batteries may explode or burst into flames without warning;

Do not insulate the device as this may aggravate the build-up of heat;

Do not cover the device;

Do not use ice or dry ice to cool the device.

Do not pick up or attempt to move a burning device or a device that is emitting smoke. The device must not be moved if displaying any of the following: Flames/flaring, smoke, unusual sounds (such as crackling), debris, or shards of material separating from device.

IN CASE OF FIRE / SMOKE IN AN OVERHEAD BIN

FIRE IN AN OVERHEAD BIN AND THE DEVICE IS VISIBLE AND ACCESSIBLE

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DOUSE DEVICE WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

It is essential that water (or other non-flammable liquid) is used to cool a battery that has ignited to prevent the spread of heat to other cells in the battery. If water is not available, any non-flammable liquid may be used to cool the cells and device. (*Note.— Liquid may turn to steam when applied to the hot battery.*)

MOVE PASSENGERS AWAY FROM THE AREA

Cabin crew should take prompt action if fire develops to move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions for passengers to breathe through them.

MONITOR FOR ANY RE-IGNITION. IF SMOKE/FLAMES RE-APPEARS, CONTINUE USING WATER (OR OTHER NON-FLAMMABLE LIQUID)

A battery involved in a fire can reignite and emit flames multiple times as heat is transferred to other cells in the battery. Therefore the device must be monitored regularly to identify if there is any indication that a fire risk may still exist. If there is any smoke or indication of fire the device must be doused with more water (or other non-flammable liquid).

DEVICE IS CONTAINED IN BAGGAGE AND FLAMES ARE VISIBLE

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DOUSE DEVICE WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

It is essential that water (or other non-flammable liquid) is used to cool a battery that has ignited to prevent the spread of heat to other cells in the battery. If water is not available, any non-flammable liquid may be used to cool the cells and device. (*Note.— Liquid may turn to steam when applied to the hot battery.*)

MOVE PASSENGERS AWAY FROM THE AREA

Cabin crew should take prompt action if fire develops to move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions for passengers to breathe through them.

MONITOR FOR ANY RE-IGNITION. IF SMOKE/FLAMES RE-APPEARS, CONTINUE USING WATER (OR OTHER NON-FLAMMABLE LIQUID)

A battery involved in a fire can reignite and emit flames multiple times as heat is transferred to other cells in the battery. Therefore the device must be monitored regularly to identify if there is any indication that a fire risk may still exist. If there is any smoke or indication of fire the device must be doused with more water (or other non-flammable liquid).

SMOKE IS COMING FROM AN OVERHEAD BIN

IF SAFE TO DO SO REMOVE BAG FROM OVERHEAD BIN

If there is no indication of fire remove the bag from the overhead bin.

Warning:
Do not open bag when there is any indication of smoke or flame.

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DOUSE BAG WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

If available place bag in a suitable container such as a galley unit or toilet waste bin and continue to douse with water. Not all containers are water-tight, therefore plastic bin liners should be used if available.

ACTIONS TO BE TAKEN WHEN DEVICE HAS COOLED

MOVE THE DEVICE

If, after a 10-15 minute monitoring period, there is no evidence of smoke or heat, the device can be moved, with caution. It is important to wear available personal protective equipment (e.g. protective breathing equipment, fire gloves), when moving any portable electronic device involved in a fire event.

COMPLETELY IMMERSE THE DEVICE IN WATER

Submerge the device / baggage in the most appropriate container such as a pot, jug, galley unit or toilet waste bin. Fill with enough water or non-flammable liquid to completely immerse the device. Once it is immersed it is deemed safe.

SECURE CONTAINER TO PREVENT SPILLAGE

Any container used to contain an affected device must be secured to prevent spillage.

MONITOR THE DEVICE AND THE SURROUNDING AREA FOR THE REMAINDER OF THE FLIGHT

Monitor the device and the surrounding area for the remainder of the flight to ensure that the device does not pose further risk.

OVERHEAT OR AN ELECTRICAL SMELL INVOLVING A PED

INSTRUCT PASSENGER OR CREW MEMBER TO TURN OFF THE DEVICE IMMEDIATELY; DISCONNECT POWER SUPPLY FROM DEVICE (IF APPLICABLE); TURN OFF IN-SEAT POWER, IF APPLICABLE

It is important to instruct the passenger or crew member to turn off the device immediately and if possible to disconnect the power supply. A battery has a higher likelihood of catching fire due to overheating during or immediately following a charging cycle. By removing external power from the device, it will be assured that additional energy is not being fed to the battery to promote a fire.

DEVICE MUST REMAIN OFF FOR THE DURATION OF THE FLIGHT. KEEP DEVICE VISIBLE AND MONITOR CLOSELY; UNSTABLE BATTERIES MAY IGNITE EVEN AFTER DEVICE IS TURNED OFF

It is important not to remove the battery from the device and ensure that the device remains powered off for the duration of the flight and that the device remains visible (not stowed such as in a bag or seat pocket or on a person (pocket)) and to monitor it closely. Unstable batteries may ignite even after device is turned off. Ensure device is stowed for landing.

AFTER LANDING – POST INCIDENT OFFLOADING PROCEDURES

IDENTIFY TO GROUND PERSONNEL DANGEROUS GOODS ITEM AND WHERE STOWED

Upon arrival, take the necessary steps to identify to ground staff where the item is stowed. Pass on all information about the item. Provide any PED involved in a fire or smoke event to ground personnel as per operator procedures.

COMPLETE REQUIRED DOCUMENTATION

Complete any required document such as company incident report.

MAKE APPROPRIATE ENTRY IN MAINTENANCE LOG

If required, make an entry in the aircraft maintenance log so that proper maintenance action is undertaken and that the emergency response kit or any aircraft equipment used is replenished or replaced when appropriate.

IN CASE OF FIRE INVOLVING DANGEROUS GOODS:

IMMEDIATE ACTION

NOTIFY PILOT-IN-COMMAND

Any incident concerning a fire in the cabin should be notified immediately to the pilot-in-command who should be kept informed of all actions taken and of the effect. It is essential that the cabin crew and the flight crew coordinate their actions and that each be kept fully informed of the other's actions and intentions.

Important:
Minimizing the spreading of smoke and fumes into the flight deck is critical for the continued safe operation of the aircraft, therefore it is essential to keep the flight deck door closed at all times. Crew communication and coordination is of utmost importance. The use of the interphone is the primary means of communication unless the interphone system fails.

IDENTIFY THE ITEM

Ask the passenger concerned to identify the item. The passenger may be able to give some guidance on the hazard(s) involved and how these could be dealt with. If the passenger can identify the item, refer to Section 4 for the appropriate emergency response drill.

On aircraft with only one cabin crew member, consult with the pilot-in-command as to whether the aid of a passenger should be sought in dealing with the incident.

APPLY THE APPROPRIATE FIRE-FIGHTING PROCEDURE / CHECK USE OF WATER

The appropriate emergency procedures must be applied to deal with any fire. In general, water should not be used on a spillage or when fumes are present since it may spread the spillage or increase the rate of fuming. Consideration should also be given to the possible presence of electrical components when using water extinguishers.

MOVE PASSENGERS AWAY FROM THE AREA

Cabin crew should take prompt action if fire develops to move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions for passengers to breathe through them.

MONITOR FOR ANY RE-IGNITION. IF SMOKE/FLAMES RE-APPEARS, CONTINUE APPLYING APPROPRIATE FIRE-FIGHTING PROCEDURE

Monitor the area regularly to identify if there is any indication that a fire risk may still exist. If there is any smoke or indication of fire continue to apply appropriate fire-fighting procedure.

IN CASE OF FIRE / SMOKE IN AN OVERHEAD BIN

FIRE IN AN OVERHEAD BIN AND THE DEVICE IS VISIBLE AND ACCESSIBLE

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DOUSE DEVICE WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

It is essential that water (or other non-flammable liquid) is used to cool a battery that has ignited to prevent the spread of heat to other cells in the battery. If water is not available, any non-flammable liquid may be used to cool the cells and device. (*Note.— Liquid may turn to steam when applied to the hot battery.*)

MOVE PASSENGERS AWAY FROM THE AREA

Cabin crew should take prompt action if fire develops to move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions for passengers to breathe through them.

MONITOR FOR ANY RE-IGNITION. IF SMOKE/FLAMES RE-APPEARS, CONTINUE USING WATER (OR OTHER NON-FLAMMABLE LIQUID).

A battery involved in a fire can reignite and emit flames multiple times as heat is transferred to other cells in the battery. Therefore the device must be monitored regularly to identify if there is any indication that a fire risk may still exist. If there is any smoke or indication of fire the device must be doused with more water (or other non-flammable liquid).

DEVICE IS CONTAINED IN BAGGAGE AND FLAMES ARE VISIBLE

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DOUSE DEVICE WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

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MOVE PASSENGERS AWAY FROM THE AREA

Cabin crew should take prompt action if fire develops to move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions for passengers to breathe through them.

MONITOR FOR ANY RE-IGNITION. IF SMOKE/FLAMES RE-APPEARS, CONTINUE USING WATER (OR OTHER NON-FLAMMABLE LIQUID).

A battery involved in a fire can reignite and emit flames multiple times as heat is transferred to other cells in the battery. Therefore the device must be monitored regularly to identify if there is any indication that a fire risk may still exist. If there is any smoke or indication of fire the device must be doused with more water (or other non-flammable liquid).

SMOKE IS COMING FROM AN OVERHEAD BIN

IF SAFE TO DO SO REMOVE BAG FROM OVERHEAD BIN.

If there is no indication of fire remove the bag from the overhead bin.

Warning:

Do not open bag when there is any indication of smoke or flame.

APPLY APPROPRIATE FIRE-FIGHTING PROCEDURE / OBTAIN AND USE FIRE EXTINGUISHER / CONSIDER USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

Appropriate fire-fighting and emergency procedures must be used to deal with any fire**.** Although Halon has been shown to not be effective against lithium metal fires, Halon will be effective in fighting the subsequent fire of surrounding materials, or in fighting a lithium ion battery fire.

DOUSE BAG WITH WATER (OR OTHER NON-FLAMMABLE LIQUID) TO COOL CELLS AND PREVENT IGNITION OF ADJACENT CELLS

if available place bag in a suitable container such as a galley unit or toilet waste bin and continue to douse with water. Not all containers are water-tight, therefore plastic bin liners should be used if available.

AFTER LANDING – POST INCIDENT OFFLOADING PROCEDURES

IDENTIFY TO GROUND PERSONNEL DANGEROUS GOODS ITEM AND WHERE STOWED

Upon arrival, take the necessary steps to identify to ground staff where the item is stowed.

COMPLETE REQUIRED DOCUMENTATION

Complete any required document such as company incident report.

MAKE APPROPRIATE ENTRY IN MAINTENANCE LOG

If required, make an entry in the aircraft maintenance log so that proper maintenance action is undertaken and that the emergency response kit or any aircraft equipment used is replenished or replaced when appropriate.

IN CASE OF SPILLAGE OR LEAKAGE INVOLVING DANGEROUS GOODS

IMMEDIATE ACTION

NOTIFY PILOT-IN-COMMAND

Any incident concerning dangerous goods should be notified immediately to the pilot-in-command who should be kept informed of all actions taken and of their effect. It is essential that the cabin crew and the flight crew coordinate their actions and that each be kept fully informed of the other's actions and intentions.

Important:
Minimizing the spreading of smoke and fumes into the flight deck is critical for the continued safe operation of the aircraft, therefore it is essential to keep the flight deck door closed at all times. Crew communication and coordination is of utmost importance. The use of the interphone is the primary means of communication unless the interphone system fails.

IDENTIFY THE ITEM

Ask the passenger concerned to identify the item and indicate its potential hazards. The passenger may be able to give some guidance on the hazard(s) involved and how these could be dealt with. If the passenger can identify the item, refer to Section 4 for the appropriate emergency response drill.

On aircraft with only one cabin crew member, consult with the pilot-in-command as to whether the aid of a passenger should be sought in dealing with the incident.

COLLECT EMERGENCY RESPONSE KIT OR OTHER USEFUL ITEMS

Collect emergency response kit, if provided, or collect for use in dealing with the spillage or leakage:

— a supply of paper towels or newspapers or other absorbent paper or absorbent fabric (e.g. seat cushion covers, head rest protectors);

— oven gloves or fire-resistant gloves, if available;

— at least two large polyethylene waste bin bags; and

— at least three smaller polyethylene bags, such as those used for duty-free or bar sales or, if none available, airsickness bags.

DON RUBBER GLOVES AND SMOKE HOOD

The hands should always be protected before touching suspicious packages or items. Fire-resistant gloves or oven gloves covered by polyethylene bags are likely to give suitable protection.

Gas-tight breathing equipment should always be worn when attending to an incident involving smoke, fumes or fire.

MOVE PASSENGERS AWAY FROM AREA

The use of therapeutic oxygen bottles or the passenger drop-out oxygen system to assist passengers in a smoke- or fume-filled passenger cabin should not be considered since considerable quantities of fumes or smoke would be inhaled through the valves or holes in the masks. A more effective aid to passengers in a smoke- or fume-filled environment would be the use of a wet towel or cloth held over the mouth and nose. A wet towel or cloth aids in filtering and is more effective at doing this than a dry towel or cloth. Cabin crew should take prompt action if smoke or fumes develop and move passengers away from the area involved and, if necessary, provide wet towels or cloths and give instructions to breathe through them.

PLACE DANGEROUS GOODS ITEM IN POLYETHYLENE BAGS

Note.— In the case of a spill of known or suspected dangerous goods in powder form:

- *leave everything undisturbed;*
- *do not use fire agent or water;*
- *cover area with polyethylene or other plastic bags and blankets;*
- *keep area isolated until after landing.*

With emergency response kit

If it is absolutely certain that the item will not create a problem the decision may be made not to move it. In most circumstances, however, it will be better to move the item and this should be done as suggested below. Place the item in a polyethylene bag as follows:

- prepare two bags by rolling up the sides and placing them on the floor;
- place the item inside the first bag with the closure of the item, or the point from which it is leaking from its container, at the top;
- take off the rubber gloves while avoiding skin contact with any contamination on them;
- place the rubber gloves in the second bag;
- close the first bag while squeezing out the excess air;
- twist the open end of the first bag and use a bag tie to tie it sufficiently tight to be secure but not so tight that pressure equalization cannot take place;
- place the first bag (containing the item) in the second bag, which already contains the rubber gloves and secure the open end in the same manner as that used for the first bag.

With no emergency response kit

Pick up the item and place it in a polyethylene bag. Ensure the receptacle containing the dangerous goods is kept upright or the area of leakage is at the top. Using paper towels, newspaper, etc., mop up the spillage, after having ascertained there will be no reaction between what is to be used to mop up and the dangerous goods. Place the soiled towels, etc., in another polyethylene bag. Place the gloves and bags used to protect the hands either in a separate small polyethylene bag or with the soiled towels. If extra bags are not available, place the towels, gloves, etc., in the same bag as the item. Expel excess air from the bags and close tightly so as to be secure but not so tight that pressure equalization cannot take place.

STOW POLYETHYLENE BAGS

If there is a catering or bar box on board, empty any contents and place the box on the floor, with the door upward. Place the bag(s) containing the item and any soiled towels, etc., in the box and close the door. Take the box or, if there is no box, the bag(s) to a position as far away as possible from the flight deck and passengers. If a galley or toilet is fitted, consider taking the box or bag(s) there, unless it is close to the flight deck. Use a rear galley or toilet wherever possible, but do not place the box or bag(s) against the pressure bulkhead or fuselage wall. If a galley is used, the box or bag(s) can be stowed in an empty waste bin container. If a toilet is used, the box can be placed on the floor or the bag(s) stowed in an empty waste container. The toilet door should be locked from the outside. In a pressurized aircraft, if a toilet is used, any fumes will be vented away from passengers. However, if the aircraft is unpressurized there may not be positive pressure in a toilet to prevent fumes from entering the passenger cabin.

Ensure when moving a box that the opening is kept upward or when moving a bag that either receptacle containing the dangerous goods is kept upright or the area of leakage is kept at the top.

Wherever the box or bag(s) have been located, wedge them firmly in place to prevent them from moving and to keep the item upright. Ensure that the position of the box or bags will not impede disembarkation from the aircraft.

TREAT AFFECTED SEAT CUSHIONS / COVERS IN THE SAME MANNER AS DANGEROUS GOODS ITEM

Seat cushions, seat backs or other furnishings which have been contaminated by a spillage should be removed from their fixtures and placed in a large bin bag or other polyethylene bag, together with any bags used initially to cover them. They should be stowed away in the same manner as the dangerous goods item causing the incident.

COVER SPILLAGE ON CARPET / FLOOR

Cover any spillage on the carpet or furnishings with a waste bag or other polyethylene bags, if available. If not, use airsickness bags opened out so that the plastic side covers the spillage or use the plastic covered emergency information cards.

Carpet which has been contaminated by a spillage and which is still causing fumes despite being covered, should be rolled up, if possible, and placed in a large bin bag or other polyethylene bag. It should be placed in a waste bin and stowed, when possible, either in the rear toilet or rear galley. If the carpet cannot be removed it should remain covered by a large bin bag or polyethylene bags, etc., and additional bags should be used to reduce the fumes.

REGULARLY INSPECT ITEMS STOWED AWAY / CONTAMINATED FURNISHINGS

Any dangerous goods, contaminated furnishings or equipment which have been removed and stowed away or covered for safety should be subject to regular inspection.

AFTER LANDING – POST INCIDENT OFFLOADING PROCEDURES

IDENTIFY TO GROUND PERSONNEL DANGEROUS GOODS ITEM AND WHERE STOWED

Upon arrival, take the necessary steps to identify to ground staff where the item is stowed. Pass on all information about the item.

COMPLETE REQUIRED DOCUMENTATION

Complete any required document such as company incident report.

MAKE APPROPRIATE ENTRY IN MAINTENANCE LOG

If required, make an entry in the aircraft maintenance log so that proper maintenance action is undertaken and that the emergency response kit or any aircraft equipment used is replenished or replaced when appropriate.

Section 4

CHART OF DRILLS AND LIST OF DANGEROUS GOODS WITH DRILL REFERENCE NUMBERS

Amend Tables 4-2 and 4-3 as indicated:

UN No.	*Drill Code*	*Proper shipping name*
DGP/24-WP/76 (see paragraph 4.3 of this report):		
3480	9F~~Z~~	Lithium ion batteries
3481	9F~~Z~~	Lithium ion batteries contained in equipment
3481	9F~~Z~~	Lithium ion batteries packed with equipment
DGP/24-WP/21 (see paragraph 4.1 of this report):		
3507	8L	Uranium hexafluoride, radioactive material, excepted package
3508	9L	Capacitor, asymmetric
3509	9L	Packaging discarded, empty, uncleaned
3510	10L	Adsorbed gas, flammable, n.o.s.*
3511	2L	Adsorbed gas, n.o.s.*
3512	2P	Adsorbed gas, toxic, n.o.s.*
3513	2X	Adsorbed gas, oxidizing, n.o.s.*
3514	10P	Adsorbed gas, toxic, flammable, n.o.s.*
3515	2PX	Adsorbed gas, toxic, oxidizing, n.o.s.*
3516	2CP	Adsorbed gas, toxic, corrosive, n.o.s.*
3517	10CP	Adsorbed gas, toxic, flammable, corrosive, n.o.s.*
3518	2PX	Adsorbed gas, toxic, oxidizing, corrosive, n.o.s.*
3519	2CP	Boron trifluoride, adsorbed
3520	2PX	Chlorine, adsorbed
3521	2CP	Silicon tetrafluoride, adsorbed
3522	10P	Arsine, adsorbed
3523	10P	Germane, adsorbed
3524	2CP	Phosphorus pentafluoride, adsorbed
3525	10P	Phosphine, adsorbed
3526	10P	Hydrogen selenide, adsorbed

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Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel:
5.1: Review of provisions for the transport of lithium batteries

5.1 REVIEW OF PROVISIONS FOR THE TRANSPORT OF LITHIUM BATTERIES

5.1.1 LITHIUM BATTERY INFORMATION SESSION

5.1.1.1 A lithium battery information session was held at which representatives from the Federal Aviation Administration (FAA) William J. Hughes Technical Center, two cargo express carriers, and packaging companies were invited to provide information on developments in testing, packaging and fire suppression systems.

5.1.1.2 **FAA Tech Center**

5.1.1.2.1 The FAA Technical Center provided a brief summary of findings from previous tests related to lithium batteries, followed by a report on results from recent full-scale tests undertaken to demonstrate the characteristics of large battery fires in a realistic aircraft environment (B-727). Findings from previous lithium battery tests were summarized as follows:

a) **Thermal runaway.** Lithium batteries were capable of thermal runaway through cell defect, cell damage, heat, rapid discharge, or overcharging resulting in temperatures exceeding 550°C (1100°F) for lithium ion and 760°C (1400°F) for lithium metal. A single cell in thermal runway generates enough heat to cause adjacent cells to go into thermal runaway resulting in propagation from cell to cell and package to package. Thermal runaway results in the release of flammable electrolytes and, in the case of lithium metal, molten burning lithium.

b) **Self ignition.** Lithium ion will generally not self-ignite, but high temperatures can ignite packing materials, which can ignite the electrolyte. Lithium metal can self-ignite and rapidly ignite packaging.

a) **Fire suppression.** Halon 1301 suppresses open flames from lithium-ion cells in thermal runaway but does not stop the propagation from cell-to-cell. Halon 1301 has no effect on lithium metal cells.

5.1.1.2.2 The recent full-scale tests demonstrated the dangers of bulk shipments of lithium metal batteries under realistic conditions which included emergency in-flight air flow. In the main deck Class E cargo compartment, a fire triggered by a cartridge heater simulating a single cell in thermal runaway created conditions that jeopardized the cargo compartment and created smoke in the flight deck. From the first observation of fire, smoke was present in the flight deck in four minutes and the flight deck was completely obscured from smoke in less than six minutes. Testing in a Class C cargo compartment with Halon suppression was terminated because of high temperatures and smoke penetration into the main cargo compartment and flight deck. After the test was terminated, the oxygen levels in the cargo compartment increased, the Halon neared zero, and a single cell in thermal runaway ignited a flash fire in

the cargo compartment. The flash fire caused an explosion ultimately resulting in the breach of the main deck floor panels and the flight deck door being blown off its hinges into the flight deck.

5.1.1.2.3 Tests had also shown that the behavior of a burning lithium cell is very dependent on the manufacturer, chemistry, size and design of the cell. Testing on one particular chemistry, although employing a non-flammable electrolyte, resulted in an explosion when thermal runaway was induced by a cartridge heater.

5.1.1.3 Developments with cargo suppression systems and fire-resistant ULDs

5.1.1.3.1 Representatives from two cargo express carriers provided information on encouraging developments that had been made with both active and passive fire suppression systems, fire-resistant containers, fire resistant covers for pallets, smoke and vision equipment for pilots, fire suppression units for use within ULDs and gel packs that could be placed in packages.

5.1.1.4 Development of packaging standards for lithium batteries

5.1.1.4.1 Representatives from a packaging design and manufacturing company provided information on developments in performance standards for packagings to contain damaged and defective lithium batteries. The performance standards would incorporate key performance parameters such as thermal runaway containment, flame penetration, and thermal resistance. It was suggested that transport should be permitted if packaging could meet defined performance standards.

5.1.2 LITHIUM METAL BATTERIES (DGP/24-WP/9)

5.1.2.1 The panel was asked to consider forbidding lithium metal batteries on passenger and cargo aircraft. It was argued that the knowledge that current fire suppression systems in cargo holds had no effect on lithium metal fires and that currently required packagings could not contain a fire made it difficult to justify allowing their carriage as cargo. It was noted that one State and several airlines already banned lithium metal batteries as cargo on their passenger aircraft through State and operator variations. The meeting was reminded of discussions that had taken place earlier that week on safety management systems (SMS) (see paragraph 1.2 of the Report on Agenda Item 1), and it was suggested that continued carriage of lithium metal batteries went against these principles. A basic tenet of SMS was that layered defences against safety risks were necessary in ensuring that single-point failures were rarely consequential. It was suggested that the ineffectiveness of aircraft fire suppression systems on lithium metal fires was a single point of failure which, based on test results, would likely result in a catastrophic event. Continuing to transport lithium metal batteries despite the known risks was argued to be unacceptable.

5.1.2.2 The meeting was reminded of statements made by the Director of the Air Navigation Bureau during the opening of DGP/24 which provided insight into the Secretariat's growing concern with cargo safety and how the mandate of the Dangerous Goods Section would be expanded. Dangerous goods could no longer be thought of in isolation but would need to involve other parts of the aviation system such as operations, airworthiness and security. With that in mind, the Deputy Director, Safety Standardization and Infrastructure (DD/SSI), the Chief of the Flight Operations Section (C/OPS) and operations and airworthiness technical officers from the Air Navigation Bureau were present to provide insight into how other Annexes interacted with Annex 18 and how they might contribute to the panel's decisions. DD/SSI described how quantitative safety performance targets were used to make decisions on

adding or amending Standards to Annexes in other aviation segments and urged the DGP to also apply this approach. C/OPS referenced the work that DGP and the Operations Panel (OPSP) had undertaken to introduce dangerous goods requirements in Annex 6 — *Operation of Aircraft* as an example of how interdependent aviation segments were. He suggested that other Annex 6 requirements needed to be taken into account in relation to dangerous goods such as extended diversion time operations (EDTO) and fire suppression capabilities. Annex 8 — *Airworthiness of Aircraft* requirements also needed to be taken into account. A disconnect between Annex 8 and Annex 18 was cited, whereby Annex 8 requires cargo compartment fire suppression systems, including their extinguishing agents, to be designed so as to take into account a sudden and extensive fire such as could be caused by dangerous goods (for aircraft certificated on or after 12 March 2000). It was suggested that since aircraft fire suppression systems could not extinguish a lithium metal battery fire, this requirement could not be met if such items were allowed to be carried as cargo by air.

5.1.2.3 The ensuing discussion highlighted the concerns of those who were in favour of banning lithium metal from transport and those who were not. Although those against the ban did agree that there were risks in transporting lithium batteries, they believed that these risks involved non-compliant and counterfeit batteries and that many if not all reported incidents had involved these types of shipments. It was suggested that a ban would serve only to stop compliant shipments of batteries; non-compliant shipments would continue to be transported, and the number of undeclared batteries would likely increase, therefore increasing the risk to passengers and crew. A ban was seen to be unfair to the majority who did comply with the regulations and would have a negative effect on key industries such as communications, public health and safety. It was suggested that a ban would put the lives of people who depended on batteries to power medical devices such as pacemakers and defibrillators at risk. There was also a concern that the panel would be viewed as indecisive as yet more new rules would be introduced so soon after significant amendments were introduced into the current edition of the Technical Instructions. While appreciating the views expressed by operations, airworthiness and air traffic management experts, one member suggested that the world of air cargo and specifically dangerous goods could not be compared to those areas of aviation because they were closed systems, involving technically qualified staff with no choice but to comply with very strict and exacting requirements. The situation was very different with air cargo, where it was impossible to directly oversee the limitless number of shippers who offered cargo for carriage by air, despite the oversight requirements in Annex 18. The significance of the suggested disconnect between Annex 8 and Annex 18 was also questioned, noting that cargo aircraft did not require fire suppression systems. Did this mean that such aircraft should not be permitted to carry any flammable or explosive dangerous goods at all? It was suggested that the ineffectiveness of the fire suppression system should not be regarded as a potential single point failure, since the packaging was not relied upon as the only barrier against a fire propagating. There were many layers of risk mitigation in place including very stringent testing requirements, the establishment of quality management systems, and other requirements specific to the air mode which were applied to lithium batteries excepted from most of the requirements when transported by other modes. Members against a ban believed that risks would be better addressed through outreach and enforcement. It was suggested that these were lacking in many parts of the world and that efforts needed to be taken in States who were deficient in this area. This would be particularly important were a ban to come into force, because some States might believe that this would lessen the need for oversight. It was believed that even more oversight would be needed if a ban were in place, as the number of undeclared and non-compliant batteries being shipped would likely increase.

5.1.2.4 Other members supported a ban for the reasons presented with the proposal, but all but one of these members believed the ban should apply to passenger aircraft only. Although they agreed that more needed to be done to mitigate risks on cargo aircraft, a full ban was considered to be too extreme.

While the Secretariat's philosophy in all segments of aviation was not to differentiate between passenger and cargo aircraft, it was acknowledged that there were differences with regards to dangerous goods. Higher quantity limits were permitted on cargo aircraft, and certain substances forbidden on passenger aircraft were permitted on cargo. The member nominated by IFALPA was the one member who supported the proposal as written. He stated that IFALPA'S position was that the requirements for passenger and cargo aircraft should be the same. He also disagreed with an earlier statement which implied that should the fire suppression Standard in Annex 8 be taken literally, there would not be any dangerous goods permitted for transport on cargo aircraft since there were no fire suppression requirements on such aircraft. He noted that depressurization was a method of fire suppression that could meet the Annex 8 requirement. However, tests had shown that although depressurization could suppress a fire involving dangerous goods other than lithium metal batteries, it was not effective on lithium metal battery fires. IFALPA's position, which he endorsed, was that there was currently no safe way to transport lithium metal batteries and until such time that there was, they should be banned on both passenger and cargo aircraft.

5.1.2.5 Based on the fact there was little support shown for a full ban, a revised proposal was presented to the meeting which would allow lithium metal batteries to be carried on cargo aircraft in accordance with the current requirements and on passenger aircraft with the approval of the States of Origin and the Operator. Some were in favour of this approach, noting that a ban on passenger aircraft had been in effect for almost ten years in one large State. Although there had been logistical problems when the ban was first introduced, these had been effectively dealt with. Representatives from the battery industry stated that its members would likewise adapt to a ban if it were to be enforced internationally. Those members against even a partial ban believed there were parts of the world that cargo aircraft did not service and therefore there needed to be an allowance for lithium batteries to be transported on passenger aircraft. It was noted that the State that had a ban in place had an extensive cargo aircraft network, something many other parts of the world did not have. The need for replacement batteries for automatic external defibrillators (AEDs) was cited as one example where next day deliveries were often required and for which transport by air would be the only viable mode of transport to meet this need. But others felt that this was an economic argument which was not used in any other areas of aviation safety and should not be used if there were risks to safety. It was noted that the proposal did not ban lithium metal batteries packed with or contained in equipment and that that was done in order to take into account urgent medical needs.

5.1.2.6 All members agreed that non-compliant shipments were a problem and that better oversight and enforcement was needed, but those who supported a ban stressed that even fully compliant shipments posed risks. There was always the possibility of damage to perfectly manufactured and prepared shipments of batteries during transport. The probability of this happening would only increase with the upward trend in numbers of batteries being shipped. It had been cited by industry representatives that billions of batteries were being shipped each year. It was acknowledged that other dangerous goods could result in an aircraft fire, but the number of shipments of other commodities would be substantially lower than that for lithium batteries, making the risk posed correspondingly lower. Testing had shown that the heat from a suppressed fire could ignite lithium metal batteries. The fact that fully compliant lithium metal batteries could serve as fuel for an independent fire was a risk that could not be ignored. Concern was expressed that at some point a catastrophic fire would occur on an aircraft and that action had to be taken. If this resulted in an increase in non-compliance, it was thought this would affect only a small number of shipments and should not deflect the need to address the majority.

5.1.2.7 While there were differences of opinion, most believed that the results of the FAA Technical Center's full scale testing could not be ignored. Of those against the ban, all but one believed

that maintaining the status quo was inappropriate, and that even if a ban on passenger aircraft were implemented, further work was needed to ensure safe transport on cargo aircraft. Developments in fire suppression systems and packaging standards were promising, and it was believed technology was available to establish conditions under which lithium metal batteries could be transported safely. It was recognized that finding a solution would involve a multi-disciplinary approach involving experts from outside the dangerous goods world including operations, airworthiness, battery manufacturing and packaging manufacturing. To that end, an offer was made to host a multidisciplinary meeting on behalf of ICAO at the FAA Technical Center at the beginning of 2014.

5.1.2.8 It became clear that a final decision on the revised proposal which would allow lithium metal batteries to be carried on cargo aircraft in accordance with the current requirements and on passenger aircraft with the approval of the States of Origin and the Operator could not be reached during DGP/24. The revised proposal, although less restrictive than the original, would still have a major impact on industry and some members wished for more time to consult with experts within their States. Others remarked that even if the proposal were agreed in principle, there were several consequential issues that needed to be taken into account, including how to ensure that smaller sized batteries which were not subject to an operator acceptance check did not end up on passenger aircraft. Several panel members wanted to consider options which would not include a ban, such as fully regulating all lithium metal batteries, determining what types and quantities of batteries could be carried without posing an unacceptable risk, and limiting the numbers in a ULD or in a cargo compartment. Some members believed that without urgent action, a catastrophic event was inevitable and that an immediate change to the requirements was necessary. Others believed that a rushed decision would not necessarily be the right one and that every effort was needed to ensure a decision which would result in safe and stable regulations was made. On that basis, the panel agreed to continue work on the subject through correspondence and to schedule a working group in early 2014 at which time a final decision on the proposal to ban lithium metal batteries on passenger aircraft would be made.

5.1.3 TRANSPORT OF DAMAGED OR DEFECTIVE LITHIUM BATTERIES (DGP/24-WP/25)

5.1.3.1 Packing Instructions 965 to 970 contain introductory text forbidding the transport of lithium cells or batteries which are being returned to the manufacturer for safety reasons (i.e. defective or damaged batteries). A question as to whether the intention was for these batteries to be forbidden under any circumstances or if they could be transported by way of an exemption was raised.

5.1.3.2 It was noted that the introductory text in Packing Instructions 965 to 970 was similar to Special Provision A154, which was assigned to all lithium battery entries. During discussions on adding Special Provision A154 to the Technical Instructions (DGP-WG/2006, 25 October to 3 November 2006), reference had been made to aligning the text in A154 with Part 1;2.1. Since Part 1;2.1 prohibits from transport under *any circumstance* articles or substance which, as presented for transport, are liable to explode, dangerously react, produce a flame or dangerous evolution of heat etc. under normal conditions of transport, it was suggested that the intention was to forbid the transport of defective or damaged batteries under any circumstance. It was noted, however, that there was a subtle difference between the text of Special Provision A154 and Part 1;2.1 in that the latter forbade any article or substance which, *as presented for transport*, was liable to … produce a flame or dangerous evolution of heat …. It was believed that there may be times when damaged or defective lithium batteries urgently needed to be transported by air and that such batteries could be transported safely if appropriate precautions were taken to ensure an equivalent level of safety to that provided for in the Instructions. It was suggested that aligning the wording of Special Provision A154 and the introductory text of Packing Instructions 965

to 970 with Part 1;2.1 coupled with a requirement for approval from the States of Origin and of the Operator would allow for this. It was further proposed that lithium batteries "identified by the manufacturer" as being defective for safety reasons was too restrictive in that other entities could also potentially determine that cells or batteries were defective. Amendments to Special Provision A154 and Packing Instructions 965 to 970 were proposed to address this.

5.1.3.3 Although there was support for some of the editorial changes and clarifications included with the proposal, most believed that the current text addressed the original intent of the provisions. It was noted that the UN Sub-Committee spent a considerable amount of time on the text, which was added at a time when a number of battery manufacturers were recalling defective batteries. The panel wanted to prevent these batteries from being transported by air, but intentionally did not include "under any circumstance" to allow for the possibility of an exemption if necessary. Although the proposed amendment was not agreed, there was support for the development of guidance material. This would be considered during the next biennium.

5.1.4 CLARIFICATION OF REQUIREMENTS FOR TRANSPORT OF LITHIUM BATTERIES IN EQUIPMENT (DGP/24-WP/29, REVISED)

5.1.4.1 The meeting was reminded that the lithium battery handling label and documentation was required on packages of more than four cells or two batteries contained in equipment but not for packages of equipment containing smaller quantities of batteries. There is also a requirement for the words "lithium ion batteries, in compliance with Section II of PI967" or "lithium metal batteries, in compliance with Section II of PI970" to appear on the air waybill when one is used. However, there was currently no requirement to reference lithium batteries on an air waybill accompanying packages containing smaller quantities of batteries. It was reported that this complicated the acceptance process. An amendment requiring that the words "lithium ion batteries, not restricted" for Packing Instruction 967 and "lithium metal batteries, not restricted" for Packing Instruction 970 was therefore proposed.

5.1.4.2 While there was sympathy for the proposal, it was believed that the requirement would cause confusion because there would be a note on the air waybill accompanying a package which did not have a lithium battery handling label applied. There was also concern with the use of "not restricted" as this might give the impression that these batteries were not restricted when in fact they were. The amendment was not agreed.

5.1.5 DENIALS OF LITHIUM BATTERIES SHIPMENTS (DGP/24-WP/30)

5.1.5.1 It was reported that lithium batteries prepared in accordance with Section II of Packing Instructions 965 to 970 requiring the lithium battery handling label and documentation had been refused carriage by operators at airports that did not handle dangerous goods. It was suggested that lithium batteries prepared in accordance with Section II of Packing Instructions 965 to 970 did not pose any greater risk in handling than those batteries meeting the requirements of Special Provision A123 and did not require separation from non-dangerous goods. A new provision in Part 7;2 was proposed to clarify this.

5.1.5.2 It was noted that since Section II batteries were not subject to other requirements of the Instructions (with the exception of 1;2.3, 7;4.4, 8;1.1 and paragraph 2 of the lithium battery packing instructions), the proposed new provision would not apply. Although it was agreed that Section II could

be offered for transport with non-dangerous goods, the panel felt that this was more of a training issue and did not believe an amendment was necessary.

5.1.6 TRANSPORT OF LITHIUM BATTERIES FOR DISPOSAL OR RECYCLING (DGP/24-WP/33)

5.1.6.1 A new special provision and packing instruction for inclusion in the Supplement to the Technical Instructions was developed to provide guidance to States when issuing approvals for the transport of lithium ion and lithium metal cells and batteries and equipment containing them for disposal or recycling. The proposal also included an amendment to Special Provision A183 in the Technical Instructions, which forbids waste batteries and batteries being shipped for recycling or disposal unless approved by the appropriate national authority, by including a reference to the new special provision and packing instruction in Supplement.

5.1.6.2 The proposal was withdrawn.

5.1.7 VEHICLES VERSUS EQUIPMENT AND THE APPLICATION OF SPECIAL PROVISION A21 (DGP/24-WP/40)

5.1.7.1 Special Provision A21 applies to **Battery-powered equipment** and **Battery-powered vehicle** (UN 3171). The special provision includes a restriction whereby equipment powered by lithium ion or lithium metal batteries cannot be classified as UN 3171, but there was no such restriction for vehicles powered by lithium batteries. Special Provision A21 requires that equipment powered by lithium batteries be classified as UN 3481 (**Lithium ion batteries contained in/packed with equipment**) or UN 3091 (**Lithium metal batteries contained in/packed with equipment**), as applicable.

5.1.7.2 The special provision includes battery-assisted bicycles and wheelchairs as examples of what could be considered a vehicle and therefore assigned to UN 3171. It was suggested that it was inappropriate for such items to be considered as vehicles. Packing Instruction 952 was assigned to UN 3171, and although this packing instruction did require that lithium batteries be subject to the applicable requirements of the UN Manual of Tests and Criteria, this packing instruction did not include the net mass limits or the packing requirements that are provided for in lithium battery packing instructions. It was believed that this may be acceptable for vehicles such as cars and motorbikes, as there was the expectation that they would have undergone some form of crash or certification testing, and the battery would be afforded a degree of protection by being installed in the vehicle. The same could not be said for items such as battery-assisted bicycles, wheelchairs and scooters where the degree of protection would be limited or not existent.

5.1.7.3 An amendment to Special Provision A21 was therefore proposed which would limit vehicles containing lithium batteries to those that have received regulatory approval from the appropriate national authority for road, waterway, maritime or aviation. References to battery-assisted bicycles, wheelchairs and lawn tractors were also proposed for deletion and added to the list of examples for equipment. It was noted that a similar amendment to the UN Model Regulations had been submitted to the UN Sub-Committee for its 44th Meeting. Since any changes approved for the 19th Edition of the Model Regulations would only become effective in 2017, the panel was invited to consider adopting the amendment to the Technical Instructions in advance of the UN Sub-Committee.

5.1.7.4 Although there was support for the intent of the proposal, the amendment was not agreed. Several members stated that the definitions for vehicles differed depending on the legislative regime and that not all vehicles went through a regulatory or approval process. The subject would be revisited during the next biennium, taking into account the outcome of discussions at the UN Sub-Committee.

5.1.8 CLASS 9 — HAZARD COMMUNICATION (DGP/24-WP/41)

5.1.8.1 A paper was presented by ICAO to the 43rd Session of the UN Sub-Committee (24 to 28 June 2013) on the need for appropriate hazard communication for electric storage systems. Although the original intent was to focus on lithium batteries, it became evident a wider discussion on Class 9 substances and articles was necessary. It was recognized by most at that meeting that the Class 9 hazard label alone did not make it possible to adequately communicate the hazard or hazards posed by the many different groups of substances and articles of Class 9, in particular when such articles contained dangerous goods of other classes or posed specific hazards such as electrical shocks or short circuits, as was the case for electric storage systems. There was, however, no final conclusion on how to improve communication. All the experts and organizations concerned were asked to give consideration to the issues raised so as to find a solution that would avoid having separate approaches for each mode of transport.

5.1.8.2 The panel supported improved communication and considered the idea of developing separate divisions or an additional class. The Secretary encouraged members to consult with emergency responders to determine how best to provide adequate information to them.

5.1.9 TRANSPORT OF LARGE LITHIUM ION BATTERIES OVER 35 KG AND EQUIPMENT CONTAINING THEM (DGP/24-WP/46) AND SECONDARY LITHIUM BATTERIES (DGP/24-WP/65)

5.1.9.1 The panel was asked to consider amending the Instructions to allow for the transport of lithium ion batteries with a net mass greater than 35 kg on cargo aircraft. Two proposals on the same subject were presented. The first proposal included an amendment to Special Provision A99 and a new packing instruction to provide for the transport of lithium ion batteries in excess of 35 kg but no larger than 400 kg and the equipment they are contained in without an approval. It was noted that large lithium batteries often consist of components that are not dangerous goods which can average sixty per cent of the mass of the battery. That proposal included safety measures such as a limit of one battery or piece of equipment in the outer packaging, the option of a 50% state of charge limit or a service disconnect, Packing Group II performance requirements, a requirement for batteries to be secured against movement within the outer packaging and for them to be protected against short circuits and thermal insulation during transport.

5.1.9.2 The second proposal invited the panel to consider two alternative approaches to allowing the transport of large lithium batteries. One was the addition of a new special provision assigned to UN 3480, **Lithium ion batteries** and the other was an amendment to Packing Instruction 965. The proposal was based on a similar one made at DGP-WG/13 (see paragraph 3.5.1 of the DGP-WG/13 Report (DGP/24-WP/3)). The revised proposals took into account some of the concerns raised at DGP-WG/13, including a requirement to limit the state of charge. Because of this extra safety feature, the new proposal required Packing Group II performance requirements instead of Packing Group I.

5.1.9.3 Some panel members believed that a new proper shipping name would be appropriate for these large batteries with a new packing instruction developed and assigned to it. There was some discussion on what would be a safe state of charge and how this could be determined. Tests in one State had revealed that different battery types, sizes and chemistries reacted differently at different states of charge, but that generally, from the current battery types that have been tested, anywhere between 20 and 30 percent state of charge provided a reduced reaction during thermal runaway events. There were questions related to the provision for a service disconnect, e.g. how this would be achieved and whether this would actually mitigate any risks related to the transport of these batteries. It was noted that an intercessional working group had been established by the UN Sub-Committee which was focusing on testing but also on issues such as state of charge and whether or not the Model Regulations needed to be amended. It was believed by some that making any decision at DGP/24 would be premature, recognizing that the UN work would continue until at least early next year.

5.1.9.4 The proposals were withdrawn.

5.1.10 LITHIUM BATTERIES — SECTION IB DOCUMENTATION REQUIREMENTS (DGP/24-WP/55)

5.1.10.1 An amendment to require a dangerous goods transport document for lithium batteries shipped under Section IB of Packing Instruction 965 or 968 was proposed. The amendment included a requirement for “IB” to follow the packing instruction number on the dangerous goods transport document. Consequential amendments were also proposed in Part 5;4.1.5.8.1 to make specific reference to the addition of “IB” on the dangerous goods transport document. It was noted that the current requirements for Section IB batteries provided an exception so that the dangerous goods transport document requirements did not have to be met, provided that alternative written documentation was provided by the shipper describing the contents of the consignment. In addition to requiring additional information on the document so that the operators could perform an acceptance check and provide information to the pilot-in-command, it was seen that this information could assist States in being able to inspect shippers of Section IB lithium battery consignments. It was reported, however, that use of “alternative documentation”, typically the air waybill, was both not suitable for the information that was required to be provided by the shipper and not meeting the objective of being able to be used by States to identify shippers of Section IB lithium battery shipments.

5.1.10.2 There was support for the amendment. It was noted that some operators had already filed variations to the Technical Instructions to require a transport document in order to provide a signed declaration and also because it simplified training. Some members questioned whether Section IB should simply be eliminated, since the only exception was for UN specification packaging and the requirement for the handling label made Section IB, in some respects, more stringent than Section IA. Whether or not the additional information was still needed was debated, but on the basis that this was a UN requirement, it could not be eliminated. It was agreed, however, that the additional information could be provided with the transport document and a note to this affect was added to Section IB.

5.1.10.3 The amendment was agreed.

5.1.11 TRANSPORT OF ELECTRONIC DEVICES WHEN ACTIVE AND PREVENTION FROM SENDING OUT SOUND OR LIGHT ALARMS FOR NON-AVIATION SAFETY REASONS (DGP/24-WP/58)

5.1.11.1 A new provision requiring that electronic devices permitted for transport when active did not send out sound or light alarms during transport was proposed for addition to Packing Instructions 967 and 970. It was suggested that many electronic devices sent out buzzing alarms for reasons unrelated to safety, such as to indicate when the battery life was low, and that this can lead to cases of unnecessary emergency response.

5.1.11.2 It was suggested that this issue was not a dangerous goods one and therefore should not be addressed in the Technical Instructions. There were similar provisions, however, in other parts of the Technical Instructions making the majority believe that it would be appropriate.

5.1.11.3 The amendment was agreed, subject to minor editorial amendments.

5.1.12 CLARIFICATION OF THE EDITION OF THE UN MANUAL OF TEST AND CRITERIA FOR LITHIUM BATTERIES AND CELLS (DGP/24-WP/59)

5.1.12.1 It was suggested that the reference to the fifth revised edition of the UN *Manual of Tests and Criteria* contained in Note 2 of all sections of Packing Instructions 965 to 970 was unclear and could lead to several different interpretations as to which edition/amendment number should be referred to when testing. The meeting was asked to clarify which edition of the UN Manual of Tests and Criteria to refer to when testing lithium batteries or cells manufactured after 1 January 2014.

5.1.12.2 It was noted that the 18th revised edition of the Model Regulations contained new text which clarified this issue. This text had been proposed for inclusion in Part 2;9 of the 2015-2016 Edition Technical Instructions through the process of harmonizing the Instructions with the UN Model Regulations (see paragraph 2.2.1 of the Report on Agenda Item 2).

5.1.12.3 It was agreed to incorporate this new text in the 2013-2014 Edition of the Technical Instructions by way of a corrigendum.

5.1.13 TRANSPORTING DAMAGED OR DEFECTIVE LITHIUM BATTERIES AND LITHIUM BATTERIES CONTAINED IN EQUIPMENT (DGP/24-WP/63)

5.1.13.1 An amendment to Special Provision A154 of the Technical Instructions and a new packing instruction for incorporation in the Supplement to the Technical Instructions was developed to provide for the transport of damaged or defective lithium ion or lithium metal cells and batteries and equipment containing them through an approval by the State of Origin. It was noted that packing instructions and special provisions for this purpose had already been introduced into the 18th Revised Edition of the Model Regulations.

5.1.13.2 The proposed amendment was based on the provisions in the Model Regulation, which included a requirement for thermal resistant packaging or overpack and performance criteria and test methods for the packaging or overpack. It was believed that the performance criteria and test methods

would ensure that any packaging used to transport damaged or defective lithium batteries or equipment containing them was capable of containing a potential thermal event.

5.1.13.3 The proposal was withdrawn.

5.1.14 **Packing Instructions 966 and 969 (DGP/24-WP/64)**

5.1.14.1 An amendment to the text in Section II.2 of the packing instructions for lithium batteries packed with equipment (Packing Instructions 966 and 969) which sets a limit on the maximum number of batteries was proposed. It was suggested that limiting the number to the minimum number required to power the equipment was inappropriate because this didn't take into account equipment such as battery chargers which were not "powered". It was noted that the equivalent provision in the Model Regulations used different wording which did not create this ambiguity, as it referred to the batteries as being "for its operation". The proposed text would align the requirement in the Technical Instructions with the Model Regulations.

5.1.14.2 Although some felt that the amended text would not address the problem, the majority believed it did provide clarification and was justified on the basis it aligned with the UN text. A revised amendment was agreed.

5.1.15 **RESPONSE TO SAFETY RECOMMENDATIONS ARISING FROM AN ACCIDENT INVESTIGATION (DGP/24-WP/69)**

5.1.15.1 A final report by the General Civil Aviation Authority of the United Arab Emirates (GCAA UAE) of the investigation of the accident involving a Boeing 747 freighter aircraft was brought to the meeting's attention. The report contained several safety recommendations, three of which related to dangerous goods. The meeting was invited to consider the recommendations and to develop an action plan to address them. This would be reviewed at the lithium battery working group meeting which was anticipated for early 2014.

5.1.16 **REQUIREMENT FOR TELEPHONE NUMBER ON LITHIUM BATTERY HANDLING LABEL (DGP/24-WP/73)**

5.1.16.1 It was noted that the example of a lithium battery handling label in Figure 5-31 clearly indicated that a telephone number must be provided on the label but that there was no requirement in the body of the Technical Instructions requiring this. It was proposed that the requirement be added to Part 5;3.5.2.2. This was agreed.

5.1.17 **REVIEW OF SPECIAL PROVISION A51 (DGP/24-WP/75)**

5.1.17.1 An amendment to Special Provision A51 which would allow aircraft lithium ion batteries up to 35 kg on passenger aircraft was proposed. This provision had been added to the 2013-2014 Edition of the Instructions but was removed by way of an addendum following the Boeing-787 Dreamliner aircraft incidents which resulted in their grounding. Since the grounding was lifted, it was proposed that the batteries should again be permitted, recognizing that the number of operators flying these aircraft continued to increase and spare aircraft batteries needed to be transported. The provision would be

particularly important in areas where the availability of cargo aircraft operations may be limited. A new requirement for the batteries to be shipped at a reduced state of charge was added to the special provision.

5.1.17.2 The Secretary reported that during discussions on the amendment to remove the provision, both the ANC and Council stated that reinstating the provision should not be revisited until the results of the investigation of the United States National Transportation Safety Board (NTSB) and the Japanese Civil Aviation Bureau could be considered. Other panel members noted that the cause of the short circuits and ensuing fires were still unknown, making any consideration to reinstate premature.

5.1.17.3 The amendment was not agreed.

5.1.18 **RECOMMENDATION**

5.1.19 In light of the foregoing discussions, the meeting developed the following recommendation:

Recommendation 5/1 — Amendment to lithium battery provisions in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284)

That provisions related to lithium batteries in the Technical Instructions be amended as indicated in Appendix A to the report on this agenda item.

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Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel:
5.2: Dangerous goods incident and accident data collection

5.2 DANGEROUS GOODS ACCIDENT AND INCIDENT REPORTING SYSTEM (DGP/24-WP/22)

5.2.1 The need for a global dangerous goods incident and accident reporting system was identified at the Dangerous Goods Panel (DGP) Working Group of the Whole on Lithium Batteries Meeting (Montréal, 6 to 10 February 2012) (DGP-WG/LB). The working group recommended that incidents involving lithium batteries be reported to ICAO for publishing on a publicly-accessible website. It was recognized that such information provided tools for identifying causal factors and potential gaps in regulations. The Air Navigation Commission (ANC), when reviewing the DGP/23 Report and the Report of the DGP-WG/LB, asked the Secretariat to consider developing a dangerous goods incident reporting system for all dangerous goods with standardized methods and procedures for gathering and coordinating data.

5.2.2 It was decided at the 2013 Meeting of the DGP Working Group of the Whole that a working group would be formed to begin developing this system. The group met at DGP/24 to develop clear requirements for the system. The end goal of the system would be to uncover safety deficiencies and to determine how to address them. This might involve actions such as changes to the dangerous goods regulations, more training and/or outreach. The group would need to determine what information the system would need to generate in order to determine these deficiencies. It would be important to focus on what output was required before determining what data was needed for input into the system. Privacy concerns would need to be taken into account.

5.2.3 The group met with officers from the Integrated Safety Management (ISM) and Accident Investigation (AIG) Sections to determine whether the dangerous goods incident and accident reporting system could be integrated with existing ICAO systems. The officers explained the mechanisms of the Accident/Incident Data Reporting (ADREP) system and its relation to the European Coordination Centre for Accident and Incident Reporting Systems (ECCAIRS). They reported on efforts to create a common taxonomy and a single repository for reporting all aviation accidents and incidents worldwide. They encouraged the idea of integrating a dangerous goods reporting system with the ADREP system rather than developing an independent system. There were already dangerous goods related fields in the ECCAIRS system, although currently the information this data provided was limited.

5.2.4 It was recognized that Annex 18 and the Technical Instructions required operators to report to the appropriate State:

a) dangerous goods accidents and incidents;

b) undeclared and misdeclared dangerous goods;

c) dangerous goods occurrences whereby dangerous goods which were not loaded, segregated, separated or secured in accordance with the Technical Instructions or

which were discovered to have been carried without information having been provided to the pilot-in-command;

but there was no requirement for States to report any of this to ICAO. Annex 13 did require States to report accidents and incidents to ICAO. Introducing a requirement for States to provide dangerous goods reports to ICAO could be considered in the future, but the group believed that States should not be burdened with new requirements until the system was developed and States could clearly see what benefits would be derived from it. It was suggested that the development of a prototype system be done on a step-by-step basis and that the initial population of the database should be provided by a small group of States, such as those who had nominated members on the DGP. Work on this system would continue through correspondence.

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Agenda Item 5: Resolution, where possible, of the non-recurrent work items identified by the Air Navigation Commission or the panel:
5.3: Dangerous goods requirements in Annex 6 — Operation of Aircraft

5.3 PROPOSED NEW STANDARDS ON TRAINING FOR ANNEX 18 (DGP/24-WP/8)

5.3.1 An amendment to the training chapter in Annex 18 was proposed to establish that all operators need to be trained, not just those who carry dangerous goods. Amendments to include the provisions for approving dangerous goods training programmes, currently contained in the Technical Instructions, were also proposed.

5.3.2 The motivation for proposing these amendments stemmed from the work undertaken to strengthen the relationship between Annex 18 and Annex 6. It was noted that the training chapter in Annex 18 (Chapter 10) contained one Standard requiring that dangerous goods training programmes be established and updated as provided for in the Technical Instructions. It was feared that even though more operators would be turning to Annex 18 as a result of the new dangerous goods material in Annex 6, those which did not carry dangerous goods might determine that they need not look any further than this Standard. It was suggested that clarification was needed to specify that the training requirements in the Technical Instructions applied to all operators, not just those approved to carry dangerous goods. It was also suggested that the provisions for approving dangerous goods training programmes should appear in Annex 18.

5.3.3 There was strong support for the proposal, although a few concerns were raised with the wording. It was suggested that referring to “all entities performing any function prescribed in the Technical Instructions” would exclude some functions that weren’t prescribed in the Technical Instructions but for which training was required. It was also suggested that “approved to carry dangerous goods” should be replaced with “authorized to carry dangerous goods” in accordance with the language used in Annex 6. Replacing “dangerous goods training programmes required by …” with “dangerous goods training programmes required on behalf of …” was considered, but it was noted that this wording had a different interpretation in different languages and that “dangerous goods training programmes required for …” was more appropriate.

5.3.4 It was noted that some States subjected foreign operators’ training programmes to review and approval despite the fact that training programmes were only subject to the approval of the State of the Operator. It was suggested that a reference to the Standards in Annex 6 related to surveillance of operations by a foreign operator be added in a note under 10.2.

5.3.5 A revised amendment to Chapter 10 of Annex 18 taking into account the concerns raised was agreed.

5.3.6 **Recommendation**

5.3.7 In light of the foregoing discussion, the meeting developed the following recommendation:

RSPP **Recommendation 5/2 — Amendment to the training requirements in Annex 18**

That comments from States be sought on a proposed amendment to Annex 18 related to training requirements as presented in appendix B to the report on this agenda item.

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

5.4: Development of guidance material on countering the potential use of dangerous goods in an act of unlawful interference

5.4 JOINT TASK FORCE OF THE DANGEROUS GOODS PANEL AND THE AVSEC PANEL

5.4.1 At the request of the Secretary General, a joint task force to develop guidance material on countering the potential use of dangerous goods in an act of unlawful interference had been formed. This was in response to the increasing importance the ICAO Council was placing on the need for coordination between the Aviation Security Panel (AVSECP) and the DGP.

5.4.2 An initial meeting of the Joint Task Force of the Dangerous Goods and Aviation Security Panels was held on 25 and 26 March 2013 in Singapore. The task force developed proposed terms of reference and initial action items. A report from that meeting was prepared for both panels to approve.

5.4.3 The report had already been presented to the Twenty-Fourth Meeting of the Aviation Security Panel (AVSECP/24) which met from 8 to 12 April 2013 in Montréal. AVSECP/24 welcomed the establishment of the task force. It recommended that the task force consider all dangerous goods in its work, not only those of high consequence. The proposed terms of reference were amended accordingly. Other refinements were proposed, and the revised version was agreed by the panel.

5.4.4 Immediate action items for the task force include:

a) a comparison between Annex 17 and Annex 18 in an effort to determine potential overlaps and/or contradictions; and

a) clarification of key terms including high consequence versus high risk.

5.4.5 The report was presented to the DGP Working Group of the Whole Meeting held in Montréal from 15 to 19 April 2013 (DGP-WG/13). DGP-WG/13 was encouraged by the work of the joint task force. It agreed to the proposed action items and terms of reference as revised by AVSECP/24 and welcomed AVSECP's decision to expand the scope of the work beyond high-consequence dangerous goods.

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

5.5: Development of performance standards for air operators and designated postal operators

5.5 COMPETENCY FRAMEWORKS (DGP/24-IP/1)

5.5.1.1.1 The meeting was informed of progress made in developing competency frameworks for designated postal operators (DPOs) and for operators. Several working group meetings had been held since DGP/23, the first in Montréal from 13 to 16 August 2012, the second in Washington, D.C. from 12 to 14 August 2013, and the third in Montréal from 4 to 6 September 2013. Mrs. Nicole Barrette-Sabourin, Technical Specialist on Training and Licensing Standards, provided valuable and extensive guidance at all three meetings.

5.5.1.1.2 The chairman of the working group reported that the focus of the first meeting was on developing a mature competency framework for designated postal operators (DPOs). Although the group completed a framework for DPOs, it was recognized that this was a living document that could be modified based on work between CAAs and DPOs. A draft framework for operators was also developed at that meeting.

5.5.1.1.3 The initial focus of the second meeting was to finalize the framework for operators. In order to progress the work, the group concluded that there was a need to relate the training tables in Part 1;4 of the Technical Instructions to the competency frameworks. It was recognized that the implementation of competency-based training depended on a clear explanation of this relationship, since these tables were used extensively by industry in developing training programmes. The group was reminded that competency is a "combination of skills, knowledge and attitudes to perform a task to a prescribed standard." It was determined that Tables 1-4 and 1-5 described the underpinning knowledge personnel would need to perform their specific job functions, but they did not describe the performance expected of these personnel. Describing how these functions were performed was the goal of the competency frameworks, and training derived from the competency frameworks would include the knowledge listed in the tables.

5.5.1.1.4 When the group returned to the task of completing the competency framework for operators (which began at the second and continued at the third meeting of the working group), it was determined that there were several functions that could potentially be performed by any of the categories of personnel for which competency frameworks had already been developed (e.g. shippers and freight forwarders). The group came to the conclusion that all functions for these categories of personnel could be combined into one general competency framework under the heading "competency framework for personnel involved in transporting dangerous goods". This approach removed redundancy and made it very clear that training requirements were determined based on the functions employees performed and not by their job titles. It was believed that it provided flexibility in addressing training needs which might be limited or extensive depending on what functions an employee performed.

5.5.1.1.5 The working group then began the process of developing guidance material to accompany the competency frameworks. The material included background information on competency based training principles, how it would affect stakeholders (e.g. employers, employees, instructors,

regulators, etc.), and how the dangerous goods competency frameworks could be effectively implemented and used. Work on this guidance material would continue over the course of the next biennium.

5.5.1.1.6 In focusing on functions rather than titles, the working group determined that a complete review of the training requirements in Annex 18 and the Technical Instructions was necessary, which could potentially result in further amendments to the requirements. This would also be done over the course of the next biennium.

5.5.1.2 The meeting expressed its appreciation to the working group for the work done. The new approach which resulted in one competency framework for all personnel involved in transporting dangerous goods was appreciated.

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APPENDIX A

PROPOSED AMENDMENTS TO PROVISIONS RELATED TO LITHIUM BATTERIES IN THE TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR

Part 2

CLASSIFICATION OF DANGEROUS GOODS

. . .

Chapter 9

CLASS 9 — MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES, INCLUDING ENVIRONMENTALLY HAZARDOUS SUBSTANCES

. . .

9.3 LITHIUM BATTERIES

9.3.1 Cells and batteries, cells and batteries contained in equipment, or cells and batteries packed with equipment, containing lithium in any form must be assigned to UN Nos. 3090, 3091, 3480 or 3481 as appropriate. They may be transported under these entries if they meet the following provisions:

a) each cell or battery is of the type proved to meet the requirements of each test of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;

UN Model Regulations, paragraph 2.9.4, ST/SG/AC.10/40/Add.1
DGP/24-WP/3 (paragraph 3.2.13) and DGP/24-WP/59 (paragraphs 2.2.1.1 and 5.1.12 and of this report

Note.— The following amendment will be incorporated in the 2013-2014 Edition of the Technical Instructions by way of a corrigendum.

Cells and batteries manufactured according to a type meeting the requirements of subsection 38.3 of the UN *Manual of Tests and Criteria*, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type testing may continue to be transported, unless otherwise provided in these Instructions.

Cell and battery types only meeting the requirements of the UN *Manual of Tests and Criteria*, Revision 3, are no longer valid. However, cells and batteries manufactured in conformity with such types before 1 July 2003 may continue to be transported if all other applicable requirements are fulfilled.

Note ~~1.~~.— Batteries must be of a ~~design~~ type proved to meet the testing requirements of the UN Manual of Tests and Criteria*, Part III, subsection 38.3, irrespective of whether the cells of which they are composed are of a tested ~~design~~ type.*

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

Parts of this Chapter are affected by State Variation US 2; see Table A-1

. . .

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

Packing Instruction 965

Passenger and cargo aircraft for UN 3480

1. **Introduction**

This entry applies to lithium ion or lithium polymer batteries. This packing instruction is structured as follows:

— Section IA applies to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
— Section IB applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II; and
— Section II applies to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities not exceeding the allowance permitted in Section II, Table 965-II.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

IA. **SECTION IA**

~~Section IA requirements apply to lithium ion cells with a Watt-hour rating in excess of 20 Wh and lithium ion batteries with a Watt-hour rating in excess of 100 Wh that have been determined to meet the criteria for assignment to Class 9~~.

Each cell or battery must meet all the provisions of 2;9.3.~~:~~

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

Packing Instruction 965

1A.1 **General requirements**

Part 4;1 requirements must be met.

Table 965-IA

UN number and proper shipping name		*Net quantity per package*	
		Passenger	*Cargo*
UN 3480	**Lithium ion batteries**	5 kg	35 kg

IA.2 **Additional requirements**

— Lithium ion cells and batteries must be protected against short circuits.
— Lithium ion cells and batteries must be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.
— Lithium ion batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.
— Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

IA.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

IB. **SECTION IB**

~~Section IB requirements apply to lithium ion cells with a Watt-hour rating not exceeding 20 Wh and lithium ion batteries with a Watt-hour rating not exceeding 100 Wh packed in quantities that exceed the allowance permitted in Section II, Table 965-II.~~

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Quantities of lithium ion cells or batteries that exceed the allowance permitted in Section II, Table 965-II ~~must be assigned to Class 9 and~~ are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for ~~the following:~~ the provisions of Part 6.

Lithium ion cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number "965" required by 5;4.1.5.8.1 a) must be supplemented with "IB". All other applicable provisions of Part 5;4 apply.

~~the provisions of Part 6; and~~
~~the dangerous goods transport document requirements of 5;4, provided alternative written documentation is provided by the shipper describing the contents of the consignment. Where an agreement exists with the operator, the shipper may provide the information by electronic data processing (EDP) or electronic data interchange (EDI) techniques. The information required is as follows and should be shown in the following order:~~

~~1) the name and address of the shipper and consignee;~~
~~2) UN 3480;~~
~~3) Lithium ion batteries PI 965 IB;~~

Packing Instruction 965

DGP/24-WP/3 (paragraph 3.5.4) DGP/24-WP/55 and paragraphs 2.4.1.1 and 5.1.10 of this report

~~4) the number of packages and the gross mass of each package.~~

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   — the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. — Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. — Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria, *Part III, subsection 38.3 may continue to be transported;*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

IB.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

DGP/24-WP/3 (paragraph 3.5.4) and paragraph 2.4.1.1 of this report

Table 965-IB

Contents	*Net quantity per ~~P~~package ~~quantity~~*	
	Passenger	*Cargo*
Lithium ion cells and batteries	10 kg~~G~~	10 kg~~G~~

IB.2 **Additional requirements**

— Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
— Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
— Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  — damage to cells or batteries contained therein;
  — shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  — release of contents.
— Each package must be labelled with a lithium battery handling label (Figure 5-31) in addition to the Class 9 hazard label.
— Each consignment must be accompanied with a document with an indication that:
  — the package contains lithium ion cells or batteries;
  — the package must be handled with care and that a flammability hazard exists if the package is damaged;
  — special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  — a telephone number for additional information.

Packing Instruction 965

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Note.— This information may be provided on the dangerous goods transport document.

IB.3 **Outer packagings**

Boxes *Drums* *Jerricans*

Strong outer packagings

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium ion cells and batteries offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   — the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.*— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN *Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 965-II

Contents	*Lithium ion cells and/or batteries with a Watt-hour rating not more than 2.7 Wh*	*Lithium ion cells with a Watt-hour rating more than 2.7 Wh, but not more than 20 Wh*	*Lithium ion batteries with a Watt-hour rating more than 2.7 Wh, but not more than 100 Wh*
1	*2*	*3*	*4*
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 965-II must not be combined in the same package.

Packing Instruction 965

II.2 **Additional requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- Where a consignment includes packages bearing the lithium battery handling label, the words “lithium ion batteries, in compliance with Section II of PI965” must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Strong outer packagings		

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 966

Passenger and cargo aircraft for UN 3481 (packed with equipment) only

1. **Introduction**

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3.~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Part 4;1 requirements must be met.

UN number and proper shipping name		*Package quantity (Section I)*	
		Passenger	*Cargo*
UN 3481	**Lithium ion batteries packed with equipment**	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

Packing Instruction 966

I.2 **Additional requirements**

- Lithium ion cells and batteries must be protected against short circuits.
- Lithium ion cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- For the purpose of this packing instruction, "equipment" means apparatus requiring the lithium ion batteries with which it is packed for its operation.
- Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium ion cells and batteries packed with equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and ~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   - the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria, *Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

Packing Instruction 966

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 **Additional requirements**

- Lithium ion cells and batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/24-WP/64 (paragraph 5.1.14 of this report)

- The ~~maximum~~ number of cells or batteries in each package must ~~be~~ not exceed the ~~minimum~~appropriate number ~~required to power~~ for the equipment's operation, plus two spares.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium ion cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- The words "lithium ion batteries, in compliance with Section II of PI966" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 Outer packagings

Boxes *Drums* *Jerricans*

Strong outer packagings

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

Packing Instruction 967

Passenger and cargo aircraft for UN 3481 (contained in equipment) only

1. **Introduction**

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

Section I of this packing instruction applies to lithium ion and lithium polymer cells and batteries that are assigned to Class 9. Certain lithium ion and lithium polymer cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium ion cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

UN number and proper shipping name	*Package quantity (Section I)*	
	Passenger	*Cargo*
UN 3481 **Lithium ion batteries contained in equipment**	5 kg of lithium ion cells or batteries	35 kg of lithium ion cells or batteries

I.2 **Additional requirements**

— The equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental operation during air transport.
— The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
— Batteries manufactured after 31 December 2011 must be marked with the Watt-hour rating on the outside case.

Packing Instruction 967

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium ion cells and batteries contained in equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium ion cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh;
2) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
   — the Watt-hour rating must be marked on the outside of the battery case except for those batteries manufactured before 1 January 2009~~;~~.

~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

DGP/24-WP/58 (paragraph 5.1.11)

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 **General requirements**

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium ion cells or batteries per package	5 kg	5 kg

II.2 **Additional requirements**

— The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
— Cells and batteries must be protected so as to prevent short circuits.
— The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.

Packing Instruction 967

— Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 5-31) (except button cell batteries installed in equipment (including circuit boards)).
— Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
  — the package contains lithium ion cells or batteries;
  — the package must be handled with care and that a flammability hazard exists if the package is damaged;
  — special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  — a telephone number for additional information.
— Where a consignment includes packages bearing the lithium battery handling label, the words “lithium ion batteries, in compliance with Section II of PI967” must be placed on the air waybill, when an air waybill is used.
— Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Strong outer packagings		

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 968

Passenger and cargo aircraft for UN 3090

1. **Introduction**

This entry applies to lithium metal or lithium alloy batteries. This packing instruction is structured as follows:

— Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g, which must be assigned to Class 9 and are subject to all of the applicable requirements of these Instructions;
— Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II; and
— Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table 968-II.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

IA. **SECTION IA**

~~Section IA requirements apply to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with a lithium metal content in excess of 2 g that have been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3.~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN Manual of Tests and Criteria, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

IA.1 **General requirements**

Part 4;1 requirements must be met.

Packing Instruction 968

Table 968-IA

UN number and proper shipping name		*Net quantity per package*	
		Passenger	*Cargo*
UN 3090	**Lithium metal batteries**	2.5 kg	35 kg

IA.2 **Additional requirements**

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells and batteries must be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements.
- Lithium metal batteries with a mass of 12 kg or greater and having a strong, impact-resistant outer casing, or assemblies of such batteries, may be transported when packed in strong outer packagings or protective enclosures (e.g. in fully enclosed or wooden slatted crates) not subject to the requirements of Part 6 of these Instructions, if approved by the appropriate authority of the State of Origin. A copy of the document of approval must accompany the consignment.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
  - cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging; and
  - cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive, and placed inside an outer packaging.

IA.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

IB. **SECTION IB**

~~Section IB requirements apply to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with a lithium metal content not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table 968-II~~.

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Quantities of lithium metal cells or batteries that exceed the allowance permitted in Section II, Table 968-II, ~~must be assigned to Class 9 and~~ are subject to all of the applicable provisions of these Instructions (including the requirements in paragraph 2 of this packing instruction and of this section) except for ~~the following:~~ : the provisions of Part 6.

Lithium metal cells or batteries shipped in accordance with the provisions of Section IB must be described on a dangerous goods transport document as set in Part 5;4. The packing instruction number “968” required by 5;4.1.5.8.1 a) must be supplemented with “IB”. All other applicable provisions of Part 5;4 apply.

~~— the provisions of Part 6; and~~
~~— the dangerous goods transport document requirements of 5;4, provided alternative written documentation is provided by the shipper describing the contents of the consignment. Where an agreement exists with the operator, the shipper may provide the information by electronic data processing (EDP) or electronic data interchange (EDI) techniques. The information required is as follows and should be shown in the following order:~~

~~1) the name and address of the shipper and consignee;~~
~~2) UN 3090;~~
~~3) Lithium metal batteries PI 968 IB;~~

Packing Instruction 968

DGP/24-WP/3 (paragraph 3.5.4) DGP/24-WP/55 and paragraphs 2.4.1.1 and 5.1.10 of this report

~~4) the number of packages and the gross mass of each package.~~

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and~~if they meet all of~~ the following:

1) for lithium metal cells, the lithium content is not more than 1 g;
2) for lithium metal or lithium alloy batteries, the aggregate lithium content is not more than 2 g~~;~~.
~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria, *Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

IB.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

DGP/24-WP/3 (paragraph 3.5.4) and paragraph 2.4.1.1 of this report

Table 968-IB

Contents	*Net quantity per ~~P~~package ~~quantity~~*	
	Passenger	*Cargo*
Lithium metal cells and batteries	2.5 kg~~G~~	2.5 kg~~G~~

IB.2 **Additional requirements**

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery then placed in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31) in addition to the Class 9 hazard label.
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.

DGP/24-WP/55 (paragraph 5.1.10 of this report)

Note.— This information may be provided on the dangerous goods transport document.

Packing Instruction 968

IB.3 **Outer packagings**

Boxes *Drums* *Jerricans*

Strong outer packagings

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew)and paragraph 2 of this packing instruction, lithium metal or lithium alloy cells and batteries offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium metal or lithium alloy cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and ~~if they meet all of~~ the following:

1) for a lithium metal cell, the lithium content is not more than 1 g;
2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g~~;~~.
~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1. Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2. Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Table 968-II

Contents	*Lithium metal cells and/or batteries with a lithium content not more than 0.3 g*	*Lithium metal cells with a lithium content more than 0.3 g but not more than 1 g*	*Lithium metal batteries with a lithium content more than 0.3 g but not more than 2 g*
1	*2*	*3*	*4*
Maximum number of cells / batteries per package	No limit	8 cells	2 batteries
Maximum net quantity (mass) per package	2.5 kg	n/a	n/a

The limits specified in columns 2, 3 and 4 of Table 968-II must not be combined in the same package.

II.2 **Additional requirements**

— Cells and batteries must be packed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging.
— Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
— Each package must be capable of withstanding a 1.2 m drop test in any orientation without:
  — damage to cells or batteries contained therein;
  — shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  — release of contents.
— Each package must be labelled with a lithium battery handling label (Figure 5-31).

Packing Instruction 968

— Each consignment must be accompanied with a document with an indication that:
  — the package contains lithium metal cells or batteries;
  — the package must be handled with care and that a flammability hazard exists if the package is damaged;
  — special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  — a telephone number for additional information.
— The words “lithium metal batteries, in compliance with Section II of PI968” must be placed on the air waybill, when an air waybill is used.
— Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Strong outer packagings		

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 969

Passenger and cargo aircraft for UN 3091 (packed with equipment) only

1. **Introduction**

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3.~~:~~.

~~1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Part 4;1 requirements must be met.

UN number and proper shipping name		*Package quantity (Section I)*	
		Passenger	*Cargo*
UN 3091	**Lithium metal batteries packed with equipment**	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

Packing Instruction 969

I.2 **Additional requirements**

- Lithium metal cells and batteries must be protected against short circuits.
- Lithium metal cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in an outer packaging. The completed package for the cells or batteries must meet the Packing Group II performance requirements; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with equipment in a package that meets the Packing Group II performance requirements.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- For the purpose of this packing instruction, “equipment” means apparatus requiring the lithium batteries with which it is packed for its operation.
- For lithium metal cells and batteries prepared for transport on passenger aircraft as Class 9:
  - cells and batteries offered for transport on passenger aircraft must be packed in intermediate or outer rigid metal packaging surrounded by cushioning material that is non-combustible and non-conductive and placed inside an outer packaging.

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Steel (3A2)
Other metal (4N)	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents),8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium metal cells and batteries packed with equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) ~~if they meet all of~~ and the following:

1) for a lithium metal cell, the lithium content is not more than 1 g;
2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g~~;~~.
3) ~~each cell or battery is of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3;~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria, *Part III, subsection 38.3 may continue to be transported.*~~

4) ~~cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

Packing Instruction 969

II.1 **General requirements**

Cells and batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

II.2 **Additional requirements**

- Lithium metal cells or batteries must:
  - be placed in inner packagings that completely enclose the cell or battery, then placed in a strong outer packaging; or
  - be placed in inner packagings that completely enclose the cell or battery, then placed with the equipment in a strong outer packaging.
- Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.
- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.

DGP/24-WP/64 (paragraph 5.1.14 of this report)

- The ~~maximum~~ number of cells or batteries in each package must ~~be~~ not exceed the ~~minimum~~appropriate number ~~required to power~~ for the equipment's operation, plus two spares.
- Each package of cells or batteries, or the completed package, must be capable of withstanding a 1.2 m drop test in any orientation without:
  - damage to cells or batteries contained therein;
  - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
  - release of contents.
- Each package must be labelled with a lithium battery handling label (Figure 5-31).
- Each consignment must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- The words “lithium metal batteries, in compliance with Section II of PI969” must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes *Drums* *Jerricans*

Strong outer packagings

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word “Overpack”.

Packing Instruction 970

Passenger and cargo aircraft for UN 3091 (contained in equipment) only

1. **Introduction**

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

Section I of this packing instruction applies to lithium metal and lithium alloy cells and batteries that are assigned to Class 9. Certain lithium metal and lithium alloy cells and batteries offered for transport and meeting the requirements of Section II of this packing instruction, subject to paragraph 2 below, are not subject to other additional requirements of these Instructions.

2. **Lithium batteries forbidden from transport**

The following applies to all lithium metal cells and batteries in this packing instruction:

Cells and batteries, identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport (e.g. those being returned to the manufacturer for safety reasons).

DGP/24-WP/3 (paragraph 3.5.3) and paragraph 2.4.1.1 of this report

I. **SECTION I**

~~Section I requirements apply to each cell or battery type that has been determined to meet the criteria for assignment to Class 9.~~

Each cell or battery must meet all the provisions of 2;9.3~~:~~.

1) ~~be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; and~~

~~*Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.*~~

~~*Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN* Manual of Tests and Criteria*, Part III, subsection 38.3 may continue to be transported.*~~

~~2) incorporate a safety venting device or be designed to preclude a violent rupture under conditions normally incident to transport and be equipped with an effective means of preventing external short circuits; and~~

~~3) be manufactured under a quality management programme as described in 2;9.3.1 e).~~

~~Each battery containing cells or a series of cells connected in parallel must be equipped with an effective means, as necessary, to prevent dangerous reverse current flow (e.g. diodes, fuses).~~

I.1 **General requirements**

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

UN number and proper shipping name	*Package quantity (Section I)*	
	Passenger	*Cargo*
UN 3091 **Lithium metal batteries contained in equipment**	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

I.2 **Additional requirements**

— The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
— The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.

Packing Instruction 970

— The quantity of lithium metal contained in any piece of equipment must not exceed 12 g per cell and 500 g per battery.

I.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
	Strong outer packagings	

II. **SECTION II**

With the exception of Part 1;2.3 (Transport of dangerous goods by post), 7;4.4 (Reporting of dangerous goods accidents and incidents), 8;1.1 (Dangerous goods carried by passengers or crew) and paragraph 2 of this packing instruction, lithium metal cells and batteries contained in equipment offered for transport are not subject to other additional requirements of these Instructions if they meet the requirements of this section.

Lithium metal cells and batteries may be offered for transport provided that each cell and battery meets the provisions of 2;9.3.1 a) and e) and ~~if they meet all of~~ the following:

1) for a lithium metal cell, the lithium content is not more than 1 g;
2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g.
~~3) each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;~~

~~Note 1.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.~~

~~Note 2.— Batteries and cells manufactured before 1 January 2014 conforming to a design type tested according to the requirements of the fifth revised edition of the UN Manual of Tests and Criteria, Part III, subsection 38.3 may continue to be transported.~~

~~4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).~~

DGP/24-WP/58 (paragraph 5.1.11)

Devices such as radio frequency identification (RFID) tags, watches and temperature loggers, which are not capable of generating a dangerous evolution of heat, may be transported when intentionally active. When active, these devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. The devices must not be capable of emitting disturbing signals (such as buzzing alarms, strobe lights, etc.) during transport.

II.1 **General requirements**

Equipment containing batteries must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.10 (except 1.1.10.1).

Contents	*Package quantity (Section II)*	
	Passenger	*Cargo*
Net quantity of lithium metal cells or batteries per package	5 kg	5 kg

Packing Instruction 970

II.2 **Additional requirements**

- The equipment must be secured against movement within the outer packaging and must be equipped with an effective means of preventing accidental activation.
- Cells and batteries must be protected so as to prevent short circuits.
- The equipment must be packed in strong outer packagings constructed of suitable material of adequate strength and design in relation to the packaging's capacity and its intended use unless the battery is afforded equivalent protection by the equipment in which it is contained.
- Each package containing more than four cells or more than two batteries installed in equipment must be labelled with a lithium battery handling label (Figure 5-31) (except button cell batteries installed in equipment (including circuit boards)).
- Each consignment with packages bearing the lithium battery handling label must be accompanied with a document with an indication that:
  - the package contains lithium metal cells or batteries;
  - the package must be handled with care and that a flammability hazard exists if the package is damaged;
  - special procedures must be followed in the event the package is damaged, to include inspection and repacking if necessary; and
  - a telephone number for additional information.
- Where a consignment includes packages bearing the lithium battery handling label, the words "lithium metal batteries, in compliance with Section II of PI970" must be placed on the air waybill, when an air waybill is used.
- Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

II.3 **Outer packagings**

Boxes	*Drums*	*Jerricans*
Strong outer packagings		

II.4 **Overpacks**

When packages are placed in an overpack, the lithium battery handling label required by this packing instruction must either be clearly visible or the label must be affixed on the outside of the overpack and the overpack must be marked with the word "Overpack".

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Part 5

SHIPPER'S RESPONSIBILITIES

Chapter 3

LABELLING

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DGP/24-WP/73 (paragraph 5.1.16 of this report)

3.5.2.2 Lithium battery handling label

Packages containing lithium batteries that meet the requirements of Section II of Packing Instructions 965 to 970 must bear a "Lithium battery" handling label shown in Figure 5-31, as required by the applicable packing instruction. The label must be a minimum dimension of 120 mm × 110 mm except labels of 74 mm × 105 mm may be used on packages containing lithium batteries where the packages are of dimensions such that they can only bear smaller labels. The label must show "Lithium metal batteries" or "Lithium ion batteries", as applicable, and a telephone number for additional information. Where the package contains both types of batteries, the label must show "Lithium metal and lithium ion batteries". Packages containing lithium batteries that meet the requirements of Section IB of Packing Instructions 965 and 968 must bear both a "Lithium battery" handling label shown in Figure 5-31 and a Class 9 hazard label (Figure 5-23).

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Chapter 4

DOCUMENTATION

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DGP/24-WP/55 (paragraph 5.1.10 of this report)

4.1.5.8 *Additional requirements*

4.1.5.8.1 The dangerous goods transport document must also contain:

a) except for radioactive material, the packing instruction applied. For shipments of lithium batteries prepared in accordance with Section IB of Packing Instruction 965 or Packing Instruction 968, the letters "IB" must be added following the packing instruction number;

~~a~~b) ~~the packing instruction applied and,~~ when applicable, reference to Special Provision A1 or A2~~, except for radioactive material~~;

~~b~~c) a statement indicating that the shipment is within the limitations prescribed for either passenger and cargo aircraft or cargo-only aircraft, as appropriate;

Note.— To qualify as acceptable for transport aboard passenger aircraft, passenger aircraft packing instruction number(s) must be used, and the package must not bear the "Cargo aircraft only" label. To qualify as acceptable for transport aboard cargo-only aircraft, cargo aircraft packing instruction number(s) must be used, and the package must bear the "Cargo aircraft only" label; or passenger aircraft instruction number(s) must be shown and no "Cargo aircraft only" label applied. However, where the packing instruction number(s) and the permitted quantity per package are identical for passenger and cargo aircraft, the "Cargo aircraft only" label should not be used.

~~c~~d) special handling information, when appropriate;

~~d~~e) an indication that an overpack has been used, when appropriate; and

~~e~~f) the "Q" value rounded up to the first decimal place, if substances are packed in accordance with 3;4.3.3 or 4;1.1.9 e).

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Part 7

OPERATOR'S RESPONSIBILITIES

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Chapter 4

PROVISION OF INFORMATION

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4.11 RETENTION OF DOCUMENTS OR INFORMATION

DGP/24-WP/55 (paragraph 5.1.10 of this report)

4.11.1 The operator must ensure that at least one copy of the documents or information appropriate to the transport by air of a consignment of dangerous goods is retained for a minimum period of three months after the flight on which the dangerous goods were transported. As a minimum, the documents or information which must be retained are the dangerous goods transport documents, the acceptance checklist (when this is in a form which requires physical completion), the written information to the pilot-in-command ~~and, for shipments offered under Section IB of Packing Instructions 965 and 968, the alternative documentation, if applicable, or information provided on it~~. These documents or the information must be made available to the appropriate national authority upon request.

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APPENDIX B

PROPOSED AMENDMENT TO THE TRAINING REQUIREMENTS IN ANNEX 18

ANNEX 18
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION

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DGP/24-WP/8 (see paragraph 5.3 of this report)

CHAPTER 10. ~~ESTABLISHMENT OF~~ TRAINING PROGRAMMES

10.1 Establishment of training programmes

Initial and recurrent ~~D~~dangerous goods training programmes shall be established and ~~updated~~ maintained as provided for in the Technical Instructions.

10.2 Approval of training programmes

10.2.1 Dangerous goods training programmes for operators shall be subjected to review and approval by the appropriate authority of the State of the Operator.

Note.— Dangerous goods training programmes are required for all operators regardless of whether or not they are authorized to carry dangerous goods.

10.2.2 Dangerous goods training programmes for designated postal operators shall be subjected to review and approval by the civil aviation authority of the State where the mail is accepted by the designated postal operator.

Recommendation.— *Dangerous goods training programmes required for entities other than operators and designated postal operators should be subjected to review and approval as determined by the appropriate national authority.*

Note 1.— See 11.4 for dangerous goods by mail.

Note 2.— See 4.2.2 of Annex 6 *— Operation of Aircraft*, Part I *— International Commercial Air Transport — Aeroplanes for surveillance of operations by a foreign operator.*

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Agenda Item 6: Other business

6.1 APPROVAL OF WORKING GROUP REPORTS (DGP/24-WP/2 AND DGP/24-WP/3)

6.1.1 The meeting reviewed the narrative parts of the reports of the meetings of the Working Groups of the Whole, DGP-WG/12 (Montréal, 15 to 19 October 2012) and DGP-WG/13 (Montréal, 15 to 19 April 2013). The narratives were approved without comment. The amendments proposed by the working groups were reviewed under DGP/24-WPs/11 (Revised), 12, 13, 14, 15, 16, 17, 18, 19 (see Report on Agenda Item 2), 20 (see Report on Agenda Item 3) and 21 (see Report on Agenda Item 4) which contained a consolidation of these amendments.

6.2 STATEMENTS BY MEMBERS

6.2.1 Several members wished to express their regret with the thirty per cent reduction in interpretation services that was provided to DGP/24 and the lack of narrative text for working papers provided in the languages of the meeting. This had made it difficult for members who were not English speakers to take full part in the proceedings of the meeting. Although providing all of the documentation for the meeting on the ICAO public website helped panel members consult with other experts in their States prior to the meeting, this benefit was limited in those States where English was not the native language. The importance of seeing amendments in all the working languages of ICAO was also important to ensure that the correct text would appear in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284), its Supplement (Doc 9284SU) and the *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481). The thirty per cent reduction in interpretation services also made it difficult for the panel to effectively discuss all of the papers presented to the panel within the two week time frame.

6.2.2 The above comments were endorsed by all panel members.

6.3 ESTABLISHMENT OF AN EDITORIAL WORKING GROUP

6.3.1 The Secretariat invited the panel to consider the possibility of reducing the length of full panel meetings to one week. This could be done by establishing a working group which would focus on straightforward, editorial amendments to the Technical Instructions. It was noted that several working papers at each panel meeting proposed amendments of a purely editorial nature; it was believed reviewing such papers by an editorial working group would be more effective and would free the panel to focus on more substantial technical issues during panel meetings. The intention would be for the working group to provide a report of its work to the full panel for its approval. This approach would be similar to the one established by the International Maritime Organization Editorial and Technical Group. The panel was asked to provide comments on this subject to the Secretariat.

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