

**TWENTY-THIRD MEETING OF THE
DANGEROUS GOODS PANEL (DGP) (2011)**

LETTER OF TRANSMITTAL

To: President, Air Navigation Commission

From: Chairman, Dangerous Goods Panel (DGP) (2011)

I have the honour to submit the report of the twenty-third meeting of the Dangerous Goods Panel (DGP) which was held in Montréal, from 11 to 21 October 2011.



Geoff Leach
Chairman

Montréal, 21 October 2011

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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-THIRD MEETING****Montréal, 11 to 21 October 2011****HISTORY OF THE MEETING****1. DURATION**

1.1 The twenty-third meeting of the Dangerous Goods Panel (DGP) was opened by Mr. Mervyn G. Fernando, President of the Air Navigation Commission in Montréal, at 1000 hours on 11 October 2011. The meeting ended on 21 October 2011.

2. ATTENDANCE

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

Members	Advisers	Nominated By
A. Tusek	L. Willoughby T. Amos	Australia
K. Vermeersch		Belgium
B. A. Carrara		Brazil
M. Paquette	D. Evans T. Howard J. Prescott G. Sansoucy E. Servant J. St-Onge D. Sylvestre	Canada
X. Qing	J. Abouchaar H. Ding L. Gang Z. Hua P. Tse K. Wan Lai-yi Q. Zhenhua	China (Hong Kong)

J. Le Tonqueze	M. Plassart P. Tatin	France
H. Brockhaus	G. Closhen H.J. Niegel B.U. Wienecke	Germany
M. Gelsomino	C. Carboni	Italy
K. Koume	A. Awano M. Horie K. Moriwaki H. Shima I. Uehara	Japan
T. Muller	H. Van der Maat	Netherlands
M. Evans		New Zealand
S. W. Park	J.S. Park	Republic of Korea
D. Mirko	D. V. Kurdchenko	Russian Federation
L.C. Bárcena		Spain
H. Al Muhairi	A. Alhmoudi P. Balasubramanian P. King	United Arab Emirates
G. Leach	H. Gilson J. Hart R. McLachlan D. Muir S. Pinnock	United Kingdom
J. McLaughlin	R. Benedict C. Betts M. Givens S. Kelley K. Miller D. Pfund C. Sarkos H. Webster	United States

D. Brennan	M. Abdul Hanif I. Molina P. Oppenheimer	IATA
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M. Rogers	S. Schwartz	IFALPA
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Advisers

E. Sigrist	W. Gramer	CEFIC
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A. Altemos B. Barrett R. Jessop N. McCulloch A. Stukas F. Wybenga	DGAC
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Observers

F. H. Carroll	Bahamas
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N. Hagmann B. Henzen R. Joss	Switzerland
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A. McCulloch	GEA
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S. Charlier F. Bognar	NATO
--------------------------	------

C. Updyke	NEMA
-----------	------

G.A. Kerchner S. Yabe	PRBA
--------------------------	------

D. Bowers A. Miyaji	UPU
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E. Supko	WNTI
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3. OFFICERS AND SECRETARIAT

3.1 Mr. Geoff Leach (United Kingdom) was elected Chairman of the meeting and Mrs. K. Vermeersch (Belgium) was elected Vice-Chairman.

3.2 The Secretary of the meeting was Dr. Katherine Rooney, Technical Officer of the Flight Operations Section, who was assisted by Ms. L. 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 Chinese, English, French, Russian and Spanish.

4. AGENDA OF THE MEETING

4.1 The agenda for the meeting shown hereunder was approved by the Air Navigation Commission on 1 March 2011.

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 2013-2014 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 2013-2014 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 2013-2014 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: Development of provisions for the carriage of dangerous goods on helicopters

5.3: Review of provisions for information to the pilot-in-command

5.4: Development of performance standards for State employees

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. Some working papers were presented in English only. The report was issued in Chinese, English, French, Russian and Spanish.

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

Good morning ladies and gentlemen.

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

On behalf of the Air Navigation Commission, it is my pleasure to welcome you again to Montréal and to ICAO Headquarters.

Subsequent to the twenty-second meeting of the panel held in October 2009, the Commission considered your report and recommended to the Council the acceptance of all your recommendations. The Council adopted Amendment 10 to Annex 18 on 4 March 2011; the amendment became effective on 18 July 2011 and will become applicable on 17 November 2011. The Council approved the amendments for the 2011 to 2012 Edition of the Technical Instructions, applicable from 1 January 2011, as well as three addenda related to additional packing requirements for oxygen generators, the transport of persons who have been subject to accidental or deliberate intake of or contamination from radioactive material and consequential amendments arising from the reformatting of the packing instructions.

Since the twenty-second meeting, there have been a number of changes in membership. Messrs. Pacheco, J. T. Correa Junior, Rui, Wu, Hotta, Matsui and Richard and Ms. Raadgers have left the panel, and the Commission is grateful for the contributions they made. In their place you have been joined by Mr. Carrara nominated by Brazil; Ms. Xu nominated by China; Mr. Koume nominated by Japan; Mr. Muller nominated by the Kingdom of the Netherlands; and Ms. McLaughlin nominated by the United States. The panel now comprises of nineteen members nominated by seventeen States and two international organizations. Your work on the panel is highly appreciated by the Commission and I would particularly like to thank Messrs. Muller and Tusek; Mr. Muller for his contribution to the development of competency training standards, and Mr. Tusek for opening the ICAO dangerous goods training to States in the Pacific region.

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 professional views, 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, and, therefore, you are expected to express your own professional opinions. Moreover, the success of any ICAO panel meeting is determined by the ability of the participants to settle the technical issues in a cooperative manner and, although consensus is not an absolute requirement, it is, without any doubt, a warranty of success.

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 that, with the exception of overriding issues such as safety or efficiency, there should be a minimum three-year cycle between Annex amendments. The Commission will be interested in your discussions on the issue of State of Overflight inclusion in the exemption process as well as that dealing with oversight of the dangerous goods transport chain.

The second task of this meeting is to recommend necessary revisions to the Technical Instructions for incorporation into the 2013 to 2014 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 outcome of your discussions on ways to strengthen the harmonized approach between the Technical Instructions and the other modal regulations will be viewed with interest because of the potential benefit to all involved in dangerous goods transport.

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, on the transport of dangerous goods by helicopters, and on your review of the provisions pertaining to information to the pilot-in-command.

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 in previous meetings. Should you require any advice or assistance in your work, I trust your chairman will not hesitate to call upon the Secretariat, myself, or any member of the Commission. In any case, we will meet again towards the end of your Panel meeting in an informal debriefing to discuss your achievements. The Commissioners and I look forward to listening to your chairman on that occasion.

One final note: I am grateful for the cooperation which exists between yourselves and the Operations Panel in developing operational requirements for inclusion in Annex 6. This is exceptionally commendable because this is the kind of collaboration that the Commission would like to see involving other panels as well. So we would like to thank you very much for that.

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

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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 CONSIDERATIONS IN THE EXEMPTION PROCESS (DGP/23-WP/25 AND DGP/23-WP/51)

1.1.1 The issue of removing State of Overflight from the exemption process was discussed. It was reported that difficulties encountered by shippers or operators when attempting to obtain an exemption from States of Overflight was first raised at the eleventh meeting of the DGP in 1987 (DGP/11). It was also discussed at the Working Group of the Whole Meeting in Auckland (DGP-WG/09, 4 to 8 May 2009, DGP/22-WP/3, paragraph 3.5.1.3 refers) when it was suggested that it was virtually impossible to predict which States a flight may overfly due to the increasing use of autonomous aircraft. It was most recently discussed at DGP/22 (DGP/22-WP/100, paragraph 1.4 refers), DGP-WG/10 (DGP/23-WG/10, paragraph 3.1.4 refers) and DGP-WG/11 (DGP/23-WP/3, paragraph 3.1.1 refers).

1.1.2 An approach was presented to the meeting with the intention of acknowledging the interests of both States and operators. This approach would place the primary responsibility of the exemption process on States of Origin, transit, and destination. The operator's interaction would be primarily with these States. Exemptions would first be issued to the operators by the States of Origin, any State in which there would be a landing during transit, and the destination State. Operators would then request expedited exemption from States potentially subject to overflight. Overflight States would be permitted a finite period of time to review the request. In the absence of an initial response or acknowledgement, overflight permission would be implied. As the process would evolve over time, issues of concern to overflight States would be identified and could be addressed at the outset by the operator in their requests to States of Origin, transit, and destination.

1.1.3 It was suggested that the prerogatives of States who were not included on a flight plan but who were considered to be diversion points in case of weather or emergency should also be considered.

1.1.4 The Secretary reminded the panel of the rights of States above their territory as contained in Article 35 b) of the Chicago Convention. Recognizing that the retention by a State of sovereignty over its airspace was a fundamental tenet of the Convention while at the same time knowing that the State of Overflight might have less interest in the granting of an exemption than the other States concerned, the Secretary proposed that Annex 18 be amended to allow a State of Overflight a specified time period to consider the request. To aid discussion, a thirty day time period was suggested. However, should the State not respond within this period, acceptance of the request would be deemed to have been granted. Of course, should the State respond, the standard procedure would follow. This would therefore permit any State of Overflight interested in a specific request for an exemption to review that request and thereby not relinquish any degree of sovereignty over its airspace whilst, at the same time, not delay exemption requests simply due to lack of involvement in the process.

1.1.5 There was great appreciation for the intent of the proposal, as requests for exemptions from States of Overflight provided many practical problems which members were eager to find solutions for. There were, however, unresolved issues which needed to be addressed. These were:

- a) Concern was expressed by some panel members over the concept of assuming that lack of a response meant an exemption was granted; without written proof, diversion to a State which had not responded could put a flight crew in jeopardy. A senior

external relations and legal officer from the Legal Affairs and External Relations Bureau agreed that this could pose a problem. He suggested that the crew should carry a copy of the exemption with a document that contained the Annex 18 Standard. This was only a suggestion and it would have to be carefully considered along with other options by ICAO.

- b) The lack of a response could indicate that the exemption request was never received by the appropriate authority. Ensuring that an exemption request was made to the proper authority would not always be possible. The Secretary agreed that this was a problem given that many States had not notified ICAO of an appropriate authority within their administrations to be responsible for ensuring compliance as required by Annex 18 in paragraph 2.7 and detailed in Part S;1.1.1 of the Supplement to the Technical Instructions.
- c) Many members felt the thirty-day period was too long. Exemptions were often granted in response to emergency situations where time was crucial. Some States had emergency processing systems in place for these types of exemptions. A fourteen-day period was therefore felt to be more appropriate by most. Others felt that although fourteen days would be appropriate in most cases, in cases which were not emergencies this time frame could be inadequate. A suggestion that the fourteen-day period could be based on the receipt of the exemption granted by the State of Origin was welcomed by many members.
- d) The proposal did not address problems related to flexible aircraft routings which made it virtually impossible to predict which States a flight might overfly. One solution suggested for this was to base an exemption on a planned route. Air traffic controllers would then need to respect that planned route.

1.1.6 A representative from an intergovernmental military organization offered insight on how diplomatic clearances were dealt with in the military world. This involved political intervention and was a system based on bilateral agreements and reciprocity. Three strategies were proposed for facilitating the exemption process in a similar manner. These were:

- a) the removal of the need for exemptions between participating states — no additional exemptions would be required;
- b) if the removal of exemptions between states could not be achieved, reducing delays as much as possible would be the goal; and
- c) Development and use of common request forms by participating states.

1.1.7 The possibility of removing the State of Overflight from the exemption process with the option for States to file a difference to Annex 18 was revisited briefly by the panel. The legal officer expressed concern that this would conflict with Article 11 of the Convention.

1.1.8 The possibility of seeking guidance from States on this issue was discussed. The legal officer felt that this would be a positive approach, but that care would need to be taken in ensuring States that sovereignty over their airspace would be retained.

1.1.9 Recognizing the importance the panel and the ANC had placed on this issue, the Secretary suggested that the DGP recommend to the ANC that the proposed amendment, modified based

on the panel's comments, be sent to States and international organizations for comment. The letter would seek specific comments on issues raised by the panel. The panel agreed to this approach.

1.1.10 Recommendation

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

RSPP | Recommendation 1/1 — Amendment to the general applicability requirements in Annex 18

That comments from States be sought on a proposed amendment to Annex 18 related to the responsibilities of the State of Overflight in the exemption process.

1.2 OVERSIGHT BY STATES (DGP/23-WP/48)

1.2.1 A lack of awareness by some States of their inspection, surveillance and enforcement responsibilities beyond that of oversight of operators, revealed through safety oversight audits, was discussed at the working group meetings. It was recognized that a safe supply chain was dependent on all entities that performed a function as prescribed in its dangerous goods regulations and should be subject to State oversight. Difficulties in applying this were reported by some panel members due to the sheer number of shippers in their States. Other panel members who did have safety oversight mechanisms in place in their States provided guidance (see paragraph 3.2).

1.2.2 A proposal to clarify a State's oversight responsibilities was made in the form of an amendment to paragraph 11.1 in Annex 18. The amendment was agreed. It was noted that the need for dangerous goods operational requirements in Annex 6 raised in DGP/23-WP/100 would be further validated by the adoption of this amendment.

1.2.3 Recommendation

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

RSPP | Recommendation 1/2 — Amendment to the requirements for inspection systems in Annex 18

That Annex 18 is amended to clarify that all entities performing a function as prescribed in their dangerous goods regulations should be subject to State oversight.

1.3 DEFINITIONS**1.3.1 Amendment to the Definition for UN Number
(DGP/23-WP/49)**

1.3.2 An amendment to the definition for “UN number” in Annex 18 was agreed. The amendment was first proposed at DGP-WG/10. It would align the definition in Annex 18 with the definition in the UN Model Regulations and the Technical Instructions.

**1.3.3 Amendment to the Definition for “State of Origin” and
addition of a new definition for “State of Destination”
(DGP/23-WP/49)**

1.3.4 A new definition for “State of Destination” was added. Since the term is used in relation to the granting of exemptions in paragraph 2.1.4 of the Annex, it was generally agreed that a definition would be beneficial in that it would help ensure consistent application of it. The term was also used throughout the Technical Instructions.

1.3.5 There were differences in opinion on how the term should be defined. It was recognized that the final destination of a consignment might not always be in the same State as the airport at which the consignment was last unloaded. An amendment which would address all possible scenarios was agreed.

1.3.6 A consequential amendment to the definition for “State of Origin” was considered necessary for the sake of alignment with this new definition.

1.3.7 Recommendation

1.3.8 In light of the foregoing discussions, the meeting developed the following recommendations:

RSPP | Recommendation 1/3 — Amendment to definitions in Annex 18

That the definitions for UN Number and State of Origin in Annex 18 are amended and a new definition for “State of Destination” is added as indicated in the appendix to the report on this agenda item.

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APPENDIX

PROPOSED AMENDMENTS TO ANNEX 18

ANNEX 18

THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR

...

CHAPTER 1. DEFINITIONS

...

 See paragraph 1.3.3 of this report:

State of Destination. The State in the territory of which the consignment is finally to be unloaded from an aircraft.

State of Origin. The State in the territory of which the ~~charge consignment was~~ is first to be loaded on an aircraft.

...

 See paragraph 3.1.1 of DGP/23-WP/2:

UN number. The four-digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods to identify a substance or an article or a particular group of substances or articles.

...

CHAPTER 2. APPLICABILITY

2.1 General applicability

...

 See paragraph 1.1 of this report:

2.1.4 For the State of Overflight, if none of the criteria for granting an exemption are relevant, an exemption may be granted based solely on whether it is believed that an equivalent level of safety in air transport has been achieved. The State of Overflight shall initially respond to the request to grant an exemption as soon as practicable but in any event within fourteen calendar days of receipt of the exemption granted by the State of Origin. In the absence of an initial response within that time, the exemption request shall be deemed to have been accepted.

...

CHAPTER 11. COMPLIANCE

See paragraph 1.2 of this report:

11.1 Inspection systems

Each Contracting State shall establish inspection, surveillance and enforcement procedures for all entities performing a function prescribed in its regulations for air transport of dangerous goods with a view to achieving compliance with ~~its dangerous goods~~ those regulations.

Note.— It is envisaged that these procedures would include provisions for the inspection of both documents and cargo ~~and operators' practices~~ as well as providing a method for the investigation of alleged violations (see 11.3).

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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 2013-2014 Edition

**2.1 APPROVAL OF WORKING GROUP REPORTS
(DGP/23-WP/2 AND DGP/23-WP/3)**

2.1.1.1 The meeting reviewed the narrative parts of the reports of the meetings of the Working Groups of the Whole, DGP-WG/10 (Abu Dhabi, United Arab Emirates, 7 to 11 November 2010) and DGP-WG/11 (Atlantic City, United States, 4 to 8 April 2011). The narratives were approved without comment. The amendments proposed by the working groups were reviewed under DGP/23-WPs/4, 5, 6, 7, 8, 9, 10, 11, 12, 30 (see Report on Agenda Item 3), 49 (see Report on Agenda Item 1) and 78 (see Report on Agenda Item 4) which contained a consolidation of these amendments.

2.2 AMENDMENTS TO PART 1 OF THE TECHNICAL INSTRUCTIONS: GENERAL

**2.2.1 Draft amendments of the Technical Instructions to
Align to the UN Recommendations — Part 1
(DGP/23-WP/4)**

2.2.1.1 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 “the UN Committee of Experts”) at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.2.1.2 It was noted that issues related to the new definitions for misdeclared and undeclared dangerous goods had been raised in DGP/23-WP/24, DGP/23-WP/46 and DGP/23-WP/50. The definitions were discussed under those papers (see paragraph 2.8.2).

2.2.1.3 The amendment to the definition for net quantity had been agreed in principle at DGP-WG/11 pending further comments from the panel on different wording. No comments were raised. Concern was expressed that although the revised definition addressed articles in equipment, it might not address substances in equipment or substances in apparatuses such as mercury in manufactured articles. Further review revealed that clarification was needed for UN 3506, **Mercury contained in manufactured articles**. An amendment to Packing Instruction 869 was therefore proposed and agreed by the panel.

2.2.1.4 Some concerns were expressed with the new provisions for high consequence radioactive material:

- a) Many felt the provisions were complicated, which could have an adverse affect on facilitating their transport.

- b) It was noted that although the activity limits for americium and iridium were extremely low, shipments of these products would still be considered high consequence dangerous goods. This would result in additional operational difficulties which could lead to an increase in denials of shipment.
- c) The operator's level of responsibility was questioned in cases where it might not know that a consignment contained high consequence radioactive material. Such would be the case with special form excepted packages exceeding the transport security threshold indicated in new Table 1-7. The consignment would be considered high consequence, but neither the package nor the shipping document would have any indication of this. The possibility of requiring a statement on the transport document indicating that the package contained high consequence dangerous goods was rejected, noting that this could be counterproductive and could create a security threat.
- d) The level of operator responsibility was also questioned in cases where notification to the competent authority was required.

2.2.1.5 Although there was sympathy for the concerns expressed, it was believed that the material would need to be included in the Instructions as it had been adopted in the UN Model Regulations and in the other modal regulations. In fact, the IAEA had developed the material and intended the new text to apply beyond transport to other areas such as fixed structures.

2.2.1.6 It was noted that for the most part it would be up to the shipper to determine whether a consignment was high consequence. These provisions would most probably not be complicated to them, as they were generally well trained and knowledgeable on the subject of radioactive material, particularly in relation to the specific products they shipped. Air operators already had security plans in place, based on Annex 17 Standards, thus making air transport different to other modes which did not always have security plans.

2.2.1.7 It was agreed that the new provisions should be adopted in the Instructions, recognizing that they were not mandatory. However, it was also agreed that the concerns raised by the panel would be brought to the attention of the IAEA, particularly as they relate to denial of shipments. The IAEA had devoted much time to this subject; they needed to be aware of the possible consequences with the adoption of the new security provisions.

2.2.2 **Dangerous Goods not Subject to all of the Requirements of the Technical Instructions (DGP/23-WP/23 and DGP/23-WP/54)**

2.2.2.1 Reference was made to discussions at DGP-WG/10 and DGP-WG/11 on the need for greater clarification with respect to dangerous goods not subject to all of the requirements of the Technical Instructions (DGP/23-WP/2 (English only), paragraph 3.2.3 and DGP/23-WP/3 (English only), paragraph 3.2.1 refer). There had been general agreement at the working group meetings that in some cases the exception should apply to both dangerous goods carried as cargo and dangerous goods carried by passengers and crew while in others the exception should only be applied to dangerous goods carried as cargo. An ad hoc working group convened to list each instance where this exception was referenced and to consider which case applied. Proposed amendments were made based on these findings.

2.2.2.2 An opposing view was presented to DGP/23 whereby it was felt that the last sentence in Part 1;1.2 prohibited these exceptions from being applied to the passenger provisions (DGP/23-WP/23 refers). The sentence reads:

No person shall carry dangerous goods or cause dangerous goods to be carried aboard an aircraft in either checked or carry-on baggage or on his/her person, unless permitted by 8;1.1.2.

The panel was invited to consider that based on this text, no additional clarification was needed in the Technical Instructions.

2.2.2.3 There was some sympathy for this proposal in that it would be a simple solution to the need for clarification, but the panel felt that not specifying when the exception applied to cargo only could leave room for interpretation. This is what prompted the need for the original proposal in the first place.

2.2.2.4 The approach taken in the original proposal was agreed. It was recognized that specifying the extent of each exception would make the provision in 1;1.2 (extracted above) and 8;1.1.1 redundant. It was nevertheless agreed to retain both statements on the basis they clearly delineated the general philosophy.

2.2.2.5 An ad hoc working group was convened to thoroughly review the proposals presented in DGP/23-WP/54 and to address outstanding issues raised. The amendment was agreed, subject to editorial amendments.

2.2.3 **Incident Reporting (DGP/23-WP/33)**

2.2.3.1 An amendment which would expand the responsibilities for incident and accident reporting beyond those of the operator was proposed. The amendment was in follow-up to discussions at DGP-WG/10 and DGP-WG/11 on the recognition of shippers as a key component in a safe supply chain and on difficulties expressed in some States who did not have sufficient resources to oversee the sheer number of shippers operating in their States. A safety risk-based prioritization system of inspections was suggested as a tool for dealing with this problem (see paragraph 3.2).

2.2.3.2 It was suggested that extending the incident and reporting requirements beyond those for the operator would increase awareness of incidents or accidents, which would help States to apply this risk-based approach to oversight systems. This additional information would also help regulators to better evaluate current requirements. Although it was recognized that it would be uncommon for shippers to report on themselves, freight forwarders or even consignees might be aware of shippers not complying with dangerous goods regulations and might be willing to report.

2.2.3.3 There was support with the intent of the proposal in that more reporting would provide a better understanding of overall safety in the supply chain. There were, however, some reservations with the terminology used in the proposal:

- a) Determining when something was offered for transport and when it was accepted was open for interpretation. Some considered a consignment to have been offered when it left the shipper and that acceptance did not have to have taken place for something to be considered offered.

- b) Determining what was considered an incident was also open for interpretation. It was reported that often operators reject consignments and return them to the shipper for corrective action. No incident report is given in these cases. It was noted that the intent of the proposal was to apply the current definition for incident from Part 1;3.
- c) The intent of the new paragraph 7.2 was questioned; it was explained that the paragraph referred to consignments which did not provide any indication at the time of acceptance that they should be rejected. Once the consignment moved through the transport system, events such as a box breaking open could lead to the realization that the consignment was not properly prepared. These types of cases should be considered incidents and should be reported.
- d) The fact that many entities were not aware of any reporting requirements would need to be addressed. This would involve training and outreach, but it was felt that the benefits to safety would be worth the effort.

The amendment was simplified, taking these issues into account. The panel supported the proposal, recognizing that the revised text was not mandatory. This status could be reconsidered should the amendment to Annex 18 requirements for inspection systems be adopted (see paragraph 1.2). After some editorial amendments, it was agreed.

2.2.4 Tables 1-4 and 1-5 (DGP/23-WP/58)

2.2.4.1 It was noted that security staff screening passengers of operators who do not carry dangerous goods as cargo are required to be trained, but this was not reflected in the training requirements in Table 1-5. It was suggested that the reason for the omission in Table 1-5 was that Table 1-5 was intended specifically for operators, and security staff were not necessarily employed by the operator. A new note was proposed for inclusion after 1;4.2.7 to clarify that training was required irrespective of whether or not the operator on which passenger or cargo is to be transported carries dangerous goods as cargo. The amendment was agreed, subject to the removal of the second sentence referring to Table 1-5 on the basis that it caused unnecessary confusion.

2.2.4.2 An amendment to the keys under both Tables 1-4 and 1-5 for category 10 staff to include loadmasters was also proposed. It was suggested that none of the categories were entirely appropriate for loadmasters. Although it would appear logical to include them with crew members (other than flight crew), a loadmaster's training needs would not be covered in that category. The training requirements would be covered, however, in the flight crew members and load planners category. The amendment was agreed.

2.2.5 Dangerous Goods for Use or Sale Onboard (DGP/23-WP/64)

2.2.5.1 It was noted that many air operators offer as part of their duty free service articles which contain lithium batteries. These, however, were not included under the exceptions for dangerous goods of the operator (1;2.2.1 b)). A proposal was made to add portable electronic devices containing lithium batteries to the list of items permitted aboard an aircraft for use or sale during the flight. This was agreed.

2.2.5.2 It was also suggested that safety matches and liquefied gas lighters should be removed from 1;2.2.1 b), since most passenger flights were now non-smoking. There was agreement that safety

matches should be removed from the list, but liquefied gas lighters should be retained as operators continued to sell these items.

2.2.5.3 It was suggested that a review of what is currently being sold and used on aircraft should be carried out in order to determine if other dangerous goods are being carried which are not included with the exceptions of the operator.

2.2.5.4 It was suggested that until the next edition of the Technical Instructions is published, operators who carry these devices with lithium batteries would be breaching the requirements. It was agreed, however, that the provisions in sub-paragraph a) which permitted exceptions for special requirements would allow for their carriage until the 2013-2014 Edition of the Technical Instructions was in operational use.

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

2.3.1 **Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 2 (DGP/23-WP/5)**

2.3.1.1 The meeting reviewed amendments to Part 2 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.3.1.2 Concerns with the new note under 6.3.2.3.7 which related to classification of infectious substances were discussed under DGP/23-WP/88 (see paragraph 2.3.5).

2.3.1.3 Reference to the 15th revised edition of the Model Regulations had been added to the classification criteria for environmentally hazardous material through a corrigendum to the 2011-2012 Edition of the Instructions. It was added in the interest of inter-modal harmonization, as new criteria added to the 16th revised edition and the 2011-2012 Edition of the Technical Instructions would only take effect in the IMDG code on a volunteer basis on 1 January 2013 (mandatory on 1 January 2014). It was agreed to remove the reference.

2.3.1.4 It was noted that “national” should appear between “appropriate” and “authority” in the note under new 2;9.3. This was agreed.

2.3.1.5 The proposals for amendment to Part 2 were agreed as amended, subject to further amendments proposed during discussions of DGP/23-WP/88 (see paragraph 2.3.5).

2.3.2 **Clarification Regarding Assignment to Packing Group III for Certain Flammable Liquids (DGP/23-WP/31)**

2.3.2.1 It was suggested that the provisions in 2;3.2.2 related to assigning viscous flammable liquids with a flash point that would normally require the substance to be assigned to Packing Group II was redundant as 2;3.2.3 provided criteria for inclusion in Packing Group III for these substances. It was

therefore proposed that 2;3.2.2 be deleted. Paragraph 2;3.2.2 did include a reference to subsection 32.3 of the UN *Manual of Tests and Criteria* which was not included in 2;3.2.3. It was proposed that the reference be added to 2;3.2.3.

2.3.2.2 It was also suggested that the requirement in 2;3.2.3 d) whereby the capacity of the receptacle could not exceed 30 L needed modification. It was argued that referring to the capacity of the receptacle was inappropriate given that a receptacle is a single packaging and this value exceeded inner packaging limits permitted even for Packing Group III substances on cargo aircraft. The provision would therefore offer no benefit to shippers when applied to single packagings on a cargo aircraft. It was proposed to increase the limit to 100 L for cargo aircraft and to replace the reference to receptacles with net quantity per package.

2.3.2.3 It was agreed that the provisions in 2;3.2.2 were redundant and the wording in the proposal for 2;3.2.3 needed clarification. There were some concerns, however, with the revision to the quantity limits in 2;3.2.2 d). Most, however, agreed with the proposer in that there would be no purpose for the provision if it offered no benefits. The proposal was agreed, subject to editorial amendments to the paragraph numbering. The UN Sub-Committee would be advised of the changes agreed by the panel.

2.3.3 Use of the Word “Prohibited” (DGP/23-WP/42)

2.3.3.1 For the sake of consistency, a proposal to replace the word “prohibited” with “forbidden” in certain paragraphs of the Technical Instructions was agreed at DGP-WG/11. During discussions at that meeting, it was suggested that a list containing all references to “prohibited” in the Technical Instructions be compiled for review by DGP/23. This list was provided. It was agreed that in cases where “prohibited” referred to an article or substance, it would be replaced with “forbidden”. The Secretariat would reflect these changes in the report.

2.3.4 Clarification of Column Headers in Table 2-12 (DGP/23-WP/63)

2.3.4.1 A proposal to provide more descriptive headings for activity limits in Table 2-12 (Basic radionuclides values for individual radionuclides) was discussed. It was suggested that the current reference to A_1 and A_2 in the heading caused unnecessary difficulties in identifying which column to use when looking for an activity value for “special form” or “other form”. Users had to refer to the definitions at the beginning of the chapter for clarification. It was suggested that providing more descriptive headings would minimize the chance of errors at acceptance checks.

2.3.4.2 The Secretary reported that she sought comments from the IAEA, who had difficulties with the proposal. The descriptive text “Activity limit” was not accurate in that A_1 and A_2 were not activity limits but rather activity values. It was therefore suggested to remove “Activity limit for” from the headings, which was supported by the panel. Following confirmation from the IAEA that this was an appropriate solution, this was agreed.

2.3.5 Medical Devices or Equipment Containing Infectious Substances (DGP/23-WP/88)

2.3.5.1 A new exception for medical devices or equipment contaminated with or containing infectious substances had been added to the 17th Revised Edition of the UN Model Regulations and was proposed for inclusion as a new 2;6.3.2.3.7.1 in the Technical Instructions. These exceptions were agreed

at DGP-WG/11, subject to the addition of additional requirements which would apply to air transport. A new proposal was presented to the meeting which included these additional requirements. Before these were considered, a concern with the general philosophy of the exceptions was raised.

2.3.5.2 Although the addition of the exceptions was supported in the interest of intermodal harmonization, it was felt that the issue should be re-addressed at the UN. This approach was supported by the UN Subcommittee Chairman, who was present at the meeting. The exceptions minimized packaging standards for medical devices and equipment, but these terms (medical devices and equipment) were not defined in the new provisions. In the absence of a definition to limit their size, there was concern that the exceptions could be applied to smaller-sized equipment with Category B infectious substances present. It was suggested that guidance should be provided in the Technical Instructions to address this concern, but it was felt this would need to first be raised at the UN.

2.3.5.3 The meeting then considered the additional requirements applicable to air transport which were proposed for inclusion in the provisions. These included a requirement for absorbent material, a means of containment and marking requirements for an overpack. A few issues relating to the amendment were raised:

- a) It was felt that the absorbent material requirement was redundant since a leakproof liner was also required. The requirement was removed.
- b) Some felt the intent of the drop test needed to be more specific, i.e. what was meant by “capable of retaining the medical devices and equipment”? Some felt that regardless of the intent, this test would be difficult to perform on large equipment. Since this requirement came directly from the UN Model Regulations, the issue would need to be raised at the UN Sub-Committee.
- c) It was noted that a new note in Part 2 of the Model Regulations which related to classification of infectious substances contradicted these exceptions. The note applied to medical equipment which had been drained of free liquid not being subject to the Instructions if pathogens were neutralized or inactivated. No distinction between Category A or Category B was made in the note. The panel had initially agreed to the inclusion of the note under Part 2;6.3.2.3.3 when discussing harmonization of Part 2 with the Model Regulations, but upon further reflection it was agreed not to adopt the note. Keeping the note could result in unregulated shipments of Category A infectious substances under the new exceptions. This would be brought to the attention of the UN Sub-Committee.

2.3.5.4 The amendment, as revised, was agreed.

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

2.4.1 **Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 3 (DGP/23-WP/6)**

2.4.1.1 The meeting reviewed amendments to Part 3 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.4.1.2 It was agreed that the word “only”, which appeared in square brackets in Special Provision A44, should be included.

2.4.1.3 It was suggested the wording of the last sentence in Special Provision A44 implied that indicating the packing group on the transport document was optional. Since having the packing group on the transport document could cause confusion at acceptance, it was agreed to specify that it must not be included.

2.4.1.4 There were concerns with the new special provision for limited quantities of Division 1.4S in relation to the requirement that a package is *capable* of passing the test. It was felt that the use of the word “capable” was sufficient in that it wouldn’t provide a guarantee that the package was tested. Noting that a new paper on limited quantities of Division 1.4S would be presented, it was agreed to revisit this subject when discussing amendments to Part 4 of the Technical Instructions.

2.4.1.5 It was felt by many that a new exception for dangerous goods (previously referred to as “de minimis” quantities by the UN) which were assigned E1, E2, E4 or E5 excepted quantity codes did not belong in the excepted quantities chapter (3;5). Although the exception made reference to the excepted quantity codes, consignments would not be considered excepted quantities when shipped under the new provision. Although many felt that the provision belonged with other general exceptions in Part 1, it was agreed to keep the text in Part 3;4 in order to harmonize with the UN. As a compromise, the provision would be included in a new section 5.6 of 3;4.

2.4.1.6 It was agreed to remove the words “Excepted quantities of” at the beginning of 3;5.1.4 (which would now become 3;5.6) for the same reason described above (i.e. these were not excepted quantities). Although the Model Regulations included “and” in the list of applicable excepted quantity codes, it was agreed “or” would be more appropriate. The UN Sub-Committee would be advised of the changes agreed by the panel.

2.4.1.7 It was noted that the UN had previously assigned SP354, indicating toxic by inhalation, to UN 2381, **Dimethyl disulphide**. It was reported that it had since removed SP354, suggesting an amendment to the entry in the Instructions was justified. The meeting felt more information was needed before a decision was made. The issue would be revisited at a later time.

2.4.2 **Requirements for Formaldehyde Solutions** **(DGP/23-WP/13)**

2.4.2.1 It was suggested that the entry in Table 3-1 for **Formaldehyde solution** with not less than 25% formaldehyde, UN 2209, implied that concentrations of less than 25% formaldehyde were not regulated. It was reported that certain industry and State regulations do regulate such concentrations by classifying them as UN 3334, **Aviation regulated liquid, n.o.s.*** It was proposed that this requirement be added to the Technical Instructions through a new special provision. The initial proposal assigned the special provision to UN 2209, but it was felt assigning the special provision to a new light type entry for formaldehyde solution with less than 25 per cent formaldehyde would be more appropriate.

2.4.2.2 There was general support for the proposal, but a few concerns were raised. It was felt that account should be taken of the possibility of a stabilizer being added to the formaldehyde. In these cases, other classification criteria might apply and this should be specified in the provision. A revised proposal taking this into account was provided to the meeting. After some editorial amendments, it was agreed.

2.4.3 **Requirements for Limited Quantities of** **Environmentally Hazardous Substances** **(DGP/23-WP/14)**

2.4.3.1 It was proposed that environmentally hazardous substances (EHS) consigned as limited quantities for other modes of transport should not be subject to the Technical Instructions. The panel was reminded that prior to the 2011-2012 Edition of the Technical Instructions, classification of EHS was optional for transport by air because of the fact that these substances did not pose a risk to crew members, passengers or the aircraft. The decision to require assignment to Class 9 was made for the sake of harmonization with the other modes and also to ensure that when being handled at the airport, that appropriate hazard information was available in the event of a leak or spill to identify that the substances were EHS.

2.4.3.2 It was argued that the additional requirements for limited quantity consignments when transported by air contradicted the justification for regulating EHS in that the air mode was not harmonized with the other modes. It was therefore proposed to remove the limited quantity provisions for EHS and to assign a new special provision to indicate that small quantities of EHS would not be subject to the Instructions. The special provision would include a requirement to add the UN number on packages consigned as limited quantities for other modes of transport, adjacent to the limited quantity mark required by these modes.

2.4.3.3 There was little support for the proposal. Although it was agreed that EHS posed little risk when transported by air, consignments arrived at the airport by other modes. If the amendment was adopted, the air mode would be less restrictive than the sea mode which did require a transport document. Many felt that it would cause confusion and result in delays in acceptance. Although there was sympathy with the irony of having more restrictive requirements for the air mode when the substances posed little risk when transported by air, it was felt that the proposal deviated from the general philosophy applied in the Instructions. A solution to the problem would have to take all modes of transport into account.

**2.4.4 Requirements for Chemicals Under Pressure
(UN 3500, 3501, 3502, 3503, 3504 and 3505
(DGP/23-WP/15 Revised))**

2.4.4.1 Six new entries for chemicals under pressure were added to the Model Regulations. An amendment introducing applicable requirements in the Technical Instructions for these substances was proposed.

2.4.4.2 The meeting was informed that chemicals under pressure were liquids or solids ejected from pressure receptacles using a propellant; the chemistry was consistent with the content of aerosol containers. These products were currently assigned to UN 3161 (**Liquefied gas, n.o.s.***) and UN 3163 (**Liquefied gas, flammable, n.o.s.***), although these were not accurate descriptions for the products. The lack of an accurate description led the UN to introduce the new entries for “**Chemicals under pressure**” in the Model Regulations.

2.4.4.3 It was explained that the requirements applicable to liquefied gases were based on the physical characteristics of the gas, taking into account that damage to a package could result in the release of the entire contents. However, in the case of chemicals under pressure, only the dispersant was a gas with the remainder being liquids or solids, and therefore the total potential energy hazard presented and risk of release was not the same as that presented by the release from a package that contained only a gas or liquefied gas.

2.4.4.4 Passenger and cargo limits were proposed for Table 3-1 for these substances. Current limits which applied to aerosols, simple liquids and solids in each class, and UN 3161 and 3163 were considered when setting limits for the new entries. The panel supported the quantities proposed, but felt 75 kg was more appropriate for UN 3501. Excepted and limited quantity provisions were not permitted. Not enough data was presented to convince panel members that the passenger limits assigned to aerosols should be applied to chemicals under pressure, with the exception of UN 3500. All remaining entries would therefore be forbidden on passenger aircraft. Special Provision A1 was assigned to these forbidden entries to allow for the possibility of an approval by the State of Origin and the State of the Operator.

2.4.4.5 A new special provision was supported, subject to editorial amendments

2.4.4.6 A new packing instruction was developed (Packing Instruction 218) which contained the same requirements as the Model Regulations (P206). It was noted that cylinders used to contain chemicals under pressure were extremely robust compared to aerosols, combination packagings and single packagings. A number of revisions to the packing instruction were suggested:

- a) strong outer packagings were not required in the packing instruction for UN 3161 and UN 3163, although it was reported that for practical reasons, the cylinders were normally transported in these packagings. Some panel members expressed a preference that this additional means of protection be added. It was therefore agreed to make the use of strong outer packaging mandatory.
- b) “pressure receptacle” was replaced with “cylinder” throughout the packing instruction;
- c) an additional packing requirement limiting the capacity of non-refillable cylinders which appeared in the Model Regulations would be added;

2.4.4.7 A revised proposal based on the panel's comments was agreed, subject to editorial amendments which would be incorporated by the Secretariat.

2.4.5 **Requirements for Neutron Radiation Detectors
(DGP/23-WP/17)**

2.4.5.1 The panel discussed a proposal to add a new special provision for neutron radiation detectors containing a non-pressurized Division 2.3 gas (**Boron trifluoride**, UN 1008). It was reported that neutron detection is a key component used in nuclear arms interdiction in addition to other applications such as nuclear reactor monitoring, neutron-based cancer treatments, neutron spallation, non-destructive testing and health physics applications. Currently, UN 1008 can only be transported in accordance with Special Provision A2. It was reported approvals had been issued in two States; providing requirements under which the detectors could be transported safely as cargo would facilitate deployment and improve worldwide responsiveness to the security threat posed by certain radioactive materials.

2.4.5.2 There was support for the proposal, based on some members' experience in transporting the detectors safely under similar provisions. There was some discussion on whether or not a new packing instruction should be added, but it was agreed to keep the packing requirements in the special provision. The proposal was agreed, subject to the following revisions:

- a) A requirement for an indication on the transport document that a packing instruction number must not be indicated was added.
- b) An indication that hazard labels were required on the package was included, since none appeared in Column 5 of Table 3-1.
- c) The descriptions provided in the narrative of the working paper for neutron radiation detectors and radiation detection systems would be added to the Glossary.

2.4.6 **Special Provision for Mercury in Manufactured
Articles to Address Toxic Subsidiary Risk
(DGP/23-WP/19)**

2.4.6.1 The meeting was reminded of the UN Committee's decision to assign a Division 6.1 subsidiary risk to UN 2809, **Mercury** and to add a new entry to the dangerous goods list for UN 3506, **Mercury contained in manufactured articles**. It was noted that both these decisions were reflected in DGP/23-WP/6. The meeting was also reminded of the segregation requirements in Part 7;2.8 of the Technical Instructions whereby packages bearing Division 6.1 toxic labels must be separated from animals, foodstuffs or other edible substances. It was reported that many operators restrict the carriage of packages bearing the toxic label due to operational challenges posed by these segregation requirements.

2.4.6.2 The addition of a new special provision which would remove the requirement for shippers to apply the toxic subsidiary risk to consignments of mercury contained in manufactured articles was proposed. It was argued that the potential toxicity of mercury would not apply when the mercury was contained in articles, since the packing requirements for UN 3506 ensured that even if the article were damaged, the mercury would remain inside the package and the risk to persons or cargo would be very remote.

2.4.6.3 The proposal was agreed, subject to the addition of text requiring an indication on the transport document that transport was in accordance with the special provision.

2.4.7 **Special Provision for Lithium Ion Aircraft Batteries
(DGP/23-WP/32)**

2.4.7.1 It was noted that Special Provision A51 allowed for the transport of aircraft batteries exceeding the limit of 30 kg (but not more than 100 kg) and was applied to UN 2794 — **Batteries, wet, filled with acid** and UN 2795, **Batteries, wet, filled with alkali**. It was reported that lithium ion aircraft batteries were in production and would be fitted to new aircraft types such as the Airbus A350 and Boeing B-787. These batteries were also being considered as replacements for wet cell batteries on other aircraft in order to reduce the operating weight of the aircraft.

2.4.7.2 A new special provision was proposed which would allow single lithium ion aircraft batteries exceeding the passenger aircraft limit of 5 kg (but not more than 35 kg) which applied to UN 3480 — **Lithium ion batteries**. This would enable operators to transport these batteries when cargo aircraft were not available over certain routes or when batteries were required at short notice. It was argued that defined airworthiness standards for these batteries to be installed on aircraft would mean that safety would not be compromised.

2.4.7.3 Two options for amendment were proposed. The first proposed the addition of a new special provision applied to UN 3480, **Lithium ion batteries**, while the second proposal assigned UN 3480 to an amended Special Provision A51 which applied to UN 2794, **Batteries, wet, filled with acid** and UN 2795, **Batteries, wet, filled with alkali**.

2.4.7.4 Some members were not in favour of the proposal. It was suggested that compliance with airworthiness regulations did not imply that equipment could be safely transported as air cargo; therefore, approvals should still be required. One member had discussed this proposal with an engineer in their State's airworthiness office who was familiar with standards for batteries installed in aircraft. This colleague did not believe testing standards for installed aircraft batteries warranted special treatment for transport purposes. It was pointed out that airworthiness standards were narrowly tailored to performance issues and how the battery interacted with aircraft systems.

2.4.7.5 The majority supported the proposal. Amendment to Special Provision A51 was agreed.

2.4.8 **Dangerous Goods List — Asbestos (DGP/23-WP/37)**

2.4.8.1 A proposal to include a cross reference to **White asbestos** (UN 2590) with the lightface entry which currently existed for asbestos was agreed. It was noted that the amendment would not affect all language versions of the Technical Instructions.

2.4.9 **Dangerous Goods List — UN 1204 and UN 2059 —
Excepted Quantity Limit E0 (DGP/23-WP/38)**

2.4.9.1 A proposal to replace the "E0" excepted quantity codes currently assigned to **Nitroglycerin solution in alcohol** (UN 1204) and **Nitrocellulose solution, flammable** (UN 2059) with "E2" for Packing Group II and "E1" for Packing Group III was discussed. It was noted that Packing Instruction Y341 was assigned to Packing Group II and Y344 was assigned to Packing Group III for these substances. All other entries in Table 3-1 where Y341 applied were assigned an E2 excepted quantity

code while all other entries in Table 3-1 where Y344 applied had E1 assigned as the excepted quantity code.

2.4.9.2 The amendment was not agreed. Since the substances concerned were desensitized explosives, it was felt the UN may have had justification for not permitting transport in excepted quantities. If the amendment was to be considered, it should be raised at the UN first.

2.4.10 **Special Provision A75 (DGP/23-WP/41)**

2.4.10.1 The meeting was reminded that Special Provision A75 allowed for UN 2014, **Hydrogen peroxide, aqueous solution**, to be transported in excepted quantities provided a comparative fire test between packages containing the solution and identical packages containing water demonstrated no difference in the burning rate. It was argued that the likelihood of finding discernable differences with more accurate test equipment used today was much greater than it would have been with equipment used when the test requirements were first developed and that the test therefore precluded transport of these small devices under the special provision. A proposal to eliminate the fire test requirement in the special provision was made at DGP-WG/11, but the working group was uncomfortable with eliminating the entire requirement and felt allowing smaller differences in burning rates instead of none would be more prudent.

2.4.10.2 A new proposal was presented to the meeting based on one State's approach to grant approvals for these devices which was based on comparative maximum temperatures measured inside the package containing hydrogen peroxide versus the package containing water. In issuing an approval, this State also allowed for openings in packagings to allow for the slow escape of gas over the life of the packaging. It was proposed that this provision be added to the special provision.

2.4.10.3 There was sympathy for the intent of the proposal, but the panel wanted more information before a decision could be made, including:

- a) data to substantiate the 250° heat deviation; and
- b) a more precise degree of venting.

These issues were addressed in a revised proposal. It was agreed, subject to the replacement of "less than 0.1 ml/hour" with "not more than 0.1 ml/hour".

2.4.11 **UN3077 Environmentally Hazardous Substance, Solid, n.o.s. (DGP/23-WP/53)**

2.4.11.1 It was reported that the new provision added to the 2011-2012 Edition of the Technical Instructions for intermediate bulk containers for the transport of UN 3077, **Environmentally hazardous substance, solid, n.o.s.*** was not reflected in columns 11 and 13 of Table 3-1. A proposal to increase the maximum net quantity per package to 1 000 kg was therefore made.

2.4.11.2 There was little support for the proposal, as it was felt the maximum net quantity permitted for EHS, solid applied only when using IBCs. IBCs were not permitted anywhere else in the Technical Instructions and many people were not familiar with IBCs, which could lead to misinterpretations of the large quantity. It was argued that the maximum net quantity was not needed in Table 3-1 as it was adequately defined in the special provision.

2.4.11.3 There was, however, agreement that the explanatory text before Table 3-1 would need review in that the Column 11 and 13 descriptions indicated the quantities could only be exceeded as permitted in the Supplement with the approval of the appropriate national authorities of the State of Origin and the State of the Operator.

2.4.12 **Table 3-1 — Dangerous Goods List (DGP/23-WP/68)**

2.4.12.1 Inconsistencies with cross references listed in Table 3-1 were reported. Some entries referenced proper shipping names which no longer existed while others differed from the UN Model Regulations. Some entries referenced proper shipping names followed by the UN number, while some entries did not include the UN number.

2.4.12.2 A review was performed and amendments proposed to remedy the inconsistencies. During the review, errors were also noted in relation to substances or articles forbidden from transport under any circumstances (i.e. entries with the word “Forbidden” across columns 2 and 3 of Table 3-1). Amendments were proposed to address these errors.

2.4.12.3 It was noted that the review was based on the 16th revised edition of the Model Regulations, as the 17th edition was not yet available when the proposal was prepared. Other members had picked up inconsistencies with their review and they assisted the proposer in aligning the proposal with the 17th revised Edition. Some inconsistencies remained in relation to the inclusion of the UN number which would be addressed by the Secretariat. The amendment was agreed.

2.4.13 **Application of the Limited Quantities Mark (DGP/23-WP/74)**

2.4.13.1 An amendment to the language used in the provision for a smaller limited quantity mark was proposed. The revised text would align with the language used in the provision for smaller hazard labels on packages containing infectious substances.

2.4.13.2 The proposal was agreed.

2.4.14 **Clarification of Special Provisions A46, A50 and A77 (DGP/23-WP/77)**

2.4.14.1 A proposal for amendment to Special Provisions A46, A50 and A77 to clarify that the prescribed leakproofness test was applicable only to single packagings, and, therefore, not to the inner packagings of combination packagings was agreed without comment.

2.4.15 **Provisions for Mercury Contained in Manufactured Articles (DGP/23-WP/86 and DGP/23-WP/87)**

2.4.15.1 It was noted that several proposals related to mercury had been made at DGP-WG/11 which were accepted by the working group while others were rejected. Decisions made affected Table 3-1, special provisions, packing instructions, and other parts of the Instructions. It was felt that all proposals which had been made related to UN 3506 should be reconsidered in a consolidated manner before the panel made a final decision. Accordingly, a consolidation of amendments was presented and the panel was asked to reconsider some which had not been adopted.

2.4.15.2 A complete revision of Packing Instruction 869 was proposed in order to develop a standard set of criteria for packaging of manufactured articles which contained mercury. The work of revising the packing instruction had begun at DGP-WG/11, when inconsistencies and conflicting requirements had been reported. A proposal was submitted to the working group meeting which had received some support, but a number of concerns were raised. These concerns were addressed in a new proposal to DGP/23 which included the following amendments:

- a) The term “completely jacketed”, used in relation to electron tubes, was considered dated and was replaced by “packed”.
- b) The word “sealed” was added before “plastic units” in the note relating to mercury switches and relays.
- c) The exception for thermometers, switches and relays containing 15 g or less of mercury was moved into Special Provision A69, recognizing that this special provision already excepted small articles containing mercury.
- d) The “no limit” quantity limit was retained.
- e) The term “Total quantity per package” for combination packagings was replaced with the term “Net quantity per package”.
- f) UN 3506 would be added to 3;4.1.2 next to Class 8.

One panel member noted that since **Mercury contained in manufactured articles** was now uniquely assigned to UN 3506, the need for providing the name in the header of the packing instruction was deemed redundant and could be removed.

2.4.15.3 The amendments to Packing Instruction 869, as amended, were agreed.

2.4.15.4 A new exception for certain lamps which were not specifically addressed in Packing Instruction 869 was proposed for inclusion in Special Provision A69. It was reported that a wide range of lamps used in commercial lighting applications contained small quantities of mercury, typically 700 mg but some larger lamps for special applications contained up to 3.5 g of mercury. It was suggested that the design of these lamps was robust and that when packed for transport, each lamp was individually packed in an inner sleeve or box before being packed in outer packagings. A requirement for a 0.5 m drop test was included in proposal. This was based on an industry standard (UN-D 1400) which ensured the products were not damaged in transport and were received by the end user in good working condition. The standard required packages to be subjected to the drop test as prepared for transport.

2.4.15.5 The proposed amendments to Special Provision A69 were agreed subject to the following revisions:

- a) The subparagraphs in the list of exceptions in Special Provision A69 were arranged in what was felt to be a more logical order.
- b) The exception for thermometers, switches and relays was made more general by the addition of the words “Articles such as”. It was noted that the current text, which would now appear as subparagraph a) in A69, referred generally to articles; therefore

the text in subparagraph b) should be specific. It was explained, however, that subparagraph b) referred to articles containing mercury installed as an integral part of a machine or apparatus while a) did not.

**2.4.16 Dangerous Goods in Limited Quantities
(DGP/23-WP/89)**

2.4.16.1 Although Part 3;4.1.1 states that limited quantities of dangerous goods must meet all the applicable requirements of the Technical Instructions unless otherwise specified, it was reported that some shippers believed that labelling and documentation requirements did not apply. The addition of two new sections in Part 3;4 specifying that these requirements did apply was therefore proposed.

2.4.16.2 Some felt that these new sections were not necessary, since 3;4.1.1 already specified that limited quantities of dangerous goods must meet all other applicable requirements of the Instructions unless otherwise provide for in 3;4. Including the new sections would be redundant and might lead users to believe that whenever requirements were not specified in other parts of the Instructions, no others would apply. Others reported receiving numerous queries on this subject, and they appreciated the clarification the new paragraphs would provide.

2.4.16.3 The amendment was agreed, subject to a revision to the reference in new 3;4.7 which made it clear that all documentation requirements were applicable.

2.4.17 Special Provision A117 (DGP/23-WP/92)

2.4.17.1 It was reported that the contents of Special Provision A117, which applied to UN 3291 (**Biomedical waste, n.o.s., Clinical waste, unspecified, n.o.s., Medical waste, n.o.s., and Regulated medical waste, n.o.s.**), were inconsistent with the newer classification provisions for medical or clinical wastes in Part 2;6.3.5. An amendment to Special Provision A117 was therefore proposed.

2.4.17.2 The provision was intended to clarify that wastes containing Category A infectious substances cannot be carried as waste, although the intention was not clear to everyone. It was suggested that a reordering of the sentences would provide clarification. This was agreed.

2.4.17.3 Some questioned if the special provision was even necessary, given that it repeated information provided in Part 2. It was noted that this special provision was not included in the Model Regulations. Others felt that the special provision provided an important safety mechanism. It was suggested that if any members felt removing the special provision was justified, a new proposal should be presented to the panel.

2.4.17.4 The amendment was agreed as amended.

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

2.5.1 Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 4 (DGP/23-WP/7)

2.5.1.1 The meeting reviewed amendments to Part 4 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.5.1.2 DGP-WG/11 discussed the addition in the Model Regulations of packagings with non-removable heads to packing instructions. The working group was asked to provide comments on whether or not they should be added to the Instructions prior to DGP/23. Since no objections were raised, packagings with non-removable heads were added to the applicable packing instructions.

2.5.1.3 The inclusion of a statement in Packing Instruction 214 that transport on passenger aircraft was forbidden was questioned in that this was already specified in Table 3-1. It was agreed to remove the statement, as it did not appear in any other packing instructions and could lead users to interpret the lack of a redundant statement forbidding transport on passenger aircraft to mean that transport on passenger aircraft was permitted.

2.5.1.4 Packing instructions related to fuel cells were discussed under DGP/23-WP/44 and packing instructions related to chemicals under pressure were discussed under DGP/23-WP/15.

2.5.1.5 Since the Chlorosilanes entries in Packing Instructions 377 and 681 were now forbidden on passenger aircraft, the columns under combination packagings pertaining to passenger aircraft would be deleted. The redundant text referring to cargo aircraft only for single packagings would also be deleted.

2.5.1.6 New text at the end of Packing Instruction 622 requiring packagings to conform to Packing Group II performance level for solids was considered redundant and removed.

2.5.1.7 The word “only” was added before dangerous goods in the new text in Packing Instruction 960. This was in alignment with Special Provision A44.

2.5.1.8 It was noted that a new exception for life-saving appliances had been incorporated in Special Provision 296 of the UN Model Regulations. It was agreed this exception would be incorporated in Packing Instruction 955.

2.5.1.9 Packing Instructions 965 and 968 currently provided an option for large batteries to be packed in strong outer packagings or protective assemblies of such batteries. This option was eliminated from Packing Instruction 965 with the deletion of the word “or”, in alignment with the UN. It was noted that a comma appeared after packagings in the Model Regulations, it was agreed to add this comma. The text would also be aligned in Packing Instruction 968.

2.5.1.10 A typographical error was noted in Packing Instruction 965 where the word “slated” appeared instead of “slatted”.

**2.5.2 Revision to Packing Instruction Y203
(DGP/23-WP/18)**

2.5.2.1 A proposal to limit the size of aerosols containing toxic substances permitted under Packing Instruction Y203 was discussed. It was reported that the UN Model Regulations do restrict the size of aerosols containing toxic substances shipped under the limited quantity provisions through Special Provision SP277. The proposed amendment would therefore align the Technical Instructions with the Model Regulations.

2.5.2.2 The proposal was agreed, subject to the reversal in order of the two capacity limit requirements to align with SP277 in the Model Regulations.

**2.5.3 Packing Instruction for 1.4S Articles In Limited
Quantities (DGP/23-WP/36)**

2.5.3.1 Limited quantity provisions for certain consumer ammunition and power tools in Division 1.4S (UN 0012, UN 0014 and UN 0055) were incorporated into the Model Regulations. DGP-WG/11 agreed that the provisions should also be incorporated in the Technical Instructions in the interest of multimodal harmonization. It was agreed that a limited quantity packing instruction would be developed for DGP/23.

2.5.3.2 A proposal was presented to the meeting which included one “Y” packing instruction for all three articles, as it was felt that this would cover cartridges of comparable sizes regardless of which UN number was used. The proposal also included an increase to the maximum net quantity per package limit proposed at DGP-WG/11. It was reported that 90 to 95 per cent of the weight of these articles was inert material and that the actual quantity of dangerous goods in a 20 kg package would equal between one and two kilograms, highly interspersed in small robust articles without the power to ignite each other.

2.5.3.3 It was noted that the packing instruction in the proposal retained the UN specification codes for outer packagings. The reasoning behind this was questioned, as the only benefit in transporting dangerous goods in limited quantities for the air mode was an exception from the package testing. By requiring UN packaging, it was unclear what benefit limited quantities would provide.

2.5.3.4 It was suggested that this proposal was intended to address practical problems in transporting these articles in one State, and having the limited quantity marking applicable to the air mode would alleviate these problems. Some members on the panel felt very strongly that the general philosophy applied to limited quantities should not be changed based on the requirements in one State. This would cause confusion in training programmes and could delay acceptance checks.

2.5.3.5 Recognizing that a package of UN 0012, 0014 or 0055 prepared in accordance with the Technical Instructions would meet the limited quantity provisions of other modes, an alternate proposal was presented which removed provisions for limited quantities for these 1.4S substances and added a special provision providing for the limited quantity mark applicable to the air mode to appear on packages containing these articles.

2.5.3.6 The proposal was not agreed. Recognizing that the Instructions were meant for international application, the panel felt these issues would be better resolved in the one State where shippers encountered difficulties transporting these articles by air rather than through an amendment which went against the general philosophy of the limited quantity provisions in the Instructions. It was

recognized that whilst there were no safety concerns identified for packages containing limited quantities of UN 0012, 0014 or 0055, there was no need for them to be marked as being in limited quantities for the air mode specifically. They could, however, bear the limited quantity marking of the other modes.

2.5.4 Fuel Cell Industry Update: International Electrotechnical Commission (IEC) 62282-6-100 International Standard For Micro Fuel Cells Corrigendum (DGP/23-WP/44 and Addendum)

2.5.4.1 Discussions on the publication by the IEC of an updated international standard for micro fuel cell safety and a new IEC specification for micro fuel cell safety using water reactive fuels were held at DGP-WG/11. The working group agreed in principle to replace references to IEC PAS 62282-6-1 with reference to the updated specification IEC 62282-6-100 in Part 8;1.1.2 t) 4 and t) 8) and in Packing Instructions 216, 375, 496 and 874.

2.5.4.2 It was reported that subsequent to these discussions, the fuel cell industry reviewed the new publication and found some errors and ambiguities. A corrigendum was published. This corrigendum included correction of editorial and typographical errors, none of which would affect the overall technical principles on which the standard was based. Some DGP members expressed concerns at DGP-WG/11 with an increase to the limit permitted for formic acid vapour loss during loss of pressure testing. The corrigendum reinstated the limit specified in PAS 62282-6-1. The corrigendum was unanimously approved through member nation balloting and was being prepared for publication.

2.5.4.3 In addition to the corrigendum, an amendment to 62282-6-100 was developed and had been circulated to member nations for comments (Amendment 1). The deadline for comments would be 3 March 2012. A brief summary of the items included in the amendment and the rationale for each was provided.

2.5.4.4 Some panel members felt uncomfortable agreeing to the incorporation of the addendum in the Instructions until they had more time to review the changes. Many of their concerns were addressed during discussions with the FCHEA representative, but some wanted to consult with experts within their States before coming to a decision.

2.5.4.5 The panel was asked for guidance on how the amendment, in the event the panel did support it, could be incorporated into the Instructions before it was published. One suggestion was to place square brackets around the reference to the amendment in the DGP/23 report. Should the amendment pass without change, and if panel members supported the amendment after consultation with experts within their States, the panel could permit the Secretary to remove the brackets. The Secretary raised a potential practical problem with the scheduling of the review of the DGP/23 report by the Council. Currently, the report was scheduled for review at the end of February or early March. Every effort would be made by the Secretariat to address scheduling conflicts.

2.5.5 Orientation Arrows On Combination Packagings Containing “Hermetically Sealed” Inner Packagings (DGP/23-WP/45)

2.5.5.1 Confusion caused by the addition of an exception for orientation arrows from hermetically sealed inner packagings below a certain size, in alignment with the UN Model Regulations, was discussed at DGP-WG/11.

2.5.5.2 The meaning of the term “hermetically sealed” was discussed at the UN Subcommittee meeting and, according to the report of that meeting, the general feeling was that the term meant an air and vapour tight sealed closure. It was noted that the term was used in a number of other places in the Model Regulations that would make a single definition difficult to achieve.

2.5.5.3 It was argued that all inner packagings could be considered hermetically sealed, based on the requirements in the Instructions whereby all inner packagings containing liquid were expected to be securely sealed and expected to retain their contents throughout the transport process. This could lead shippers to believe that any combination package containing inner packagings with not more than 500 mL would not require orientation arrows.

2.5.5.4 It was suggested that the exception was intended for packages whereby the inner packagings would have to be pierced or punctured to allow for the release of the contents. An amendment making reference to the inner packaging being of that type was therefore proposed. There was support for the proposal, but a number of concerns were raised. A revised proposal was presented using the term “gas tight” and providing examples (tubes, bags, vials). It was suggested “that are opened by breaking or puncturing” would add clarity. The amendment was agreed, subject to some editorial revisions. The UN Sub-Committee would be advised of the changes agreed by the panel.

2.5.6 **Packing Instructions Y840 (DGP/23-WP/66)**

2.5.6.1 It was suggested that a requirement in Packing Instruction Y840 for glass inner packagings to be packed in an intermediate packaging had been inadvertently lost during the reformatting of the packing instructions exercise. An amendment to reinstate the requirement was proposed. The presenter asked the panel to replace the words “must be placed” with “packed and placed” before considering the proposal.

2.5.6.2 The amendment was agreed. It was noted that both Y840 and Y841 appeared in the packing instruction table, although the requirement applied only to Y840. The panel was asked whether Y840 and Y841 should be separated into two separate packing instructions, but it was agreed to keep them together. It would be obvious that that requirement applied to Packing Instruction Y840 based on the packing group.

2.5.7 **Packing Instructions (DGP/23-WP/70)**

2.5.7.1 It was suggested that the requirement in several packing instructions for fibre single packagings to be fitted with a suitable liner should apply to both fibre drums (1G) and fibreboard boxes (4G). An amendment adding fibreboard to the requirement was therefore proposed. It was also suggested that including fibre in the requirement for Packing Instructions 470-471 and 487-491 was not appropriate, since fibre drums (1G) were not permitted as single packagings in these packing instructions. An amendment deleting “fibre” from the requirement was therefore proposed.

2.5.7.2 The amendment was agreed.

2.5.8 **Clarification of Absorbent Materials Requirements in Packing Instruction Y963 (DGP/23-WP/76)**

2.5.8.1 It was suggested that the reference to consumer commodities in Class 2 in relation to the absorbent material requirement for glass or earthenware inner packaging(s) was inappropriate since only

aerosols of Division 2.1 were permitted as consumer commodities, and these could only be constructed of metal or plastic. It was agreed to remove reference to Class 2.

2.5.8.2 The amendment was agreed.

2.5.9 **Polyester Resin Kits (DGP/23-WP/83)**

2.5.9.1 The meeting discussed a proposal for amendment to Packing Instruction 370 and Y370 which applied to polyester resin kits. It had first been discussed at DGP-WG/11 and was agreed in principle.

2.5.9.2 It was noted that Packing Instruction 370 and Y370 specified quantity limitations for inner packagings containing Class 3 base material for Packing Group II or III. The quantity limitations, however, were the same for both packing groups and were aligned with those for Packing Group II.

2.5.9.3 It was reported that due to the release of volatile organic compounds from base materials, environmental directives now required manufacturers to reduce the percentage of solvent in the base. This was typically achieved with additives which ensured the application properties did not deteriorate. It resulted in an increase to the overall specific gravity of the product, since solvents that were added typically had a specific gravity of less than 1.

2.5.9.4 A shipping problem had been reported in one State whereby a polyester resin kit with Packing Group III base material had a specific gravity considerably greater than 1, which resulted in the resin kit exceeding the overall 5 kg package limit. It was suggested there was no safety justification for limiting Packing Group III substances to the quantities applicable to Packing Group II, and a proposal to provide higher quantity limits for Packing Group III was proposed. In addition, the structure of the combination packagings table was altered to be more user-friendly.

2.5.9.5 It was noted that the summary to the working paper indicated that the issue would need to be addressed at the UN. But upon further reflection, it was realized that this would not be necessary as the UN did not put a limit on the base material.

2.5.9.6 The amendment was agreed. A consequential amendment to Table 3-1 was also agreed.

2.5.10 **Packing Instruction 370 (DGP/23-WP/90)**

2.5.10.1 It was noted that Packing Instruction Y370 which applied to UN 3269, **Polyester resin kit** contained a compatibility requirement which was not contained in Packing Instruction 370. It was suggested the omission was not intentional and an amendment to add the requirement to Packing Instruction 370 was proposed.

2.5.10.2 The amendment was agreed.

2.5.11 **Packing Instruction Y373 (DGP/23-WP/91)**

2.5.11.1 It was noted that Packing Instruction 373 which applied to UN 1228, **Mercaptan mixture, liquid, flammable, toxic, n.o.s.*** contained an additional packing requirement for combination packagings which was not contained in Packing Instruction Y373. It was suggested the requirement should also apply to Y373 and an amendment to add the requirement was proposed.

2.5.11.2 The proposal was agreed.

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

2.6.1 Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 5 (DGP/23-WP/8)

2.6.1.1 The meeting reviewed amendments to Part 5 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.6.1.2 The amendments were agreed, subject to a small editorial change to 5;4.1.5.1 e).

2.6.2 Dangerous Goods in Consolidations (DGP/23-WP/67)

2.6.2.1 Multiple consignments prepared by different shippers which were subsequently consolidated by another person or organization, such as a freight forwarder, were discussed. These consignments were commonly referred to as consolidations, but no definition for consolidation existed in the Technical Instructions. A definition was therefore proposed.

2.6.2.2 A new general requirement in Part 5;1.1 was also proposed requiring separation of packages containing dangerous goods from packages which did not contain dangerous before being offered to the operator (new 5;1.1 k)). This would reduce the likelihood of unnecessary handling of dangerous goods by the operator prior to acceptance checks when packages of dangerous goods and non-dangerous goods were contained in the same consignment.

2.6.2.3 There was support for the new general requirement in 5;1.1, recognizing that this was already an industry standard between shippers, freight forwarders and operators. When considering the proposed definition for consolidations, some felt that defining a term that was often used in industry would be useful. Others felt that the addition of the requirement to separate dangerous from non dangerous goods made the definition unnecessary.

2.6.2.4 A new proposal was presented which eliminated the definition for consolidation along with the reference to it in new 5;1.1 k). A note was added which clarified that the new requirement applied to consolidated shipments.

2.6.2.5 Some members felt that the amendment should be expanded to require a separate transport document for each consignment. Others felt that this was not necessary, and that packages containing dangerous goods could be included on the same air waybill as cargo not subject to the Technical Instructions. A new note was proposed to clarify this.

2.6.2.6 The revised amendment was agreed.

2.6.3 Provision For Reduced Size Labels (DGP/23-WP/85)

2.6.3.1 It was noted that the UN Model Regulations allowed for smaller labels on any package provided the dimensions of the package were such that regular sized labels would not fit. This exception was provided in the Technical Instructions for packages of infectious substances and for certain Class 2 substances, based on an ISO standard. An amendment to extend the provision to all dangerous goods was proposed on the basis that this would allow for multi-modal harmonization. It was also suggested that the amendment would eliminate the potential for obscuring other required safety data, such as data relating to use of the material, when the labels were too large for a package.

2.6.3.2 One adviser explained that there were different legal requirements for information on packages in countries of origin and destination. Reduced-sized labels would therefore provide more flexibility for complying with these requirements. There was, however, very little support for the proposal. Labels were a primary means of communication; reducing their size would lower safety standards. There was justification for packages containing infectious substances, in that only very small packages are permitted by air. The provision for gas cylinders was an ISO standard, and many panel members felt that it should be reconsidered.

2.6.3.3 The proposal was not agreed.

2.6.4 Application of Limited Quantity Marking on Overpacks (DGP/23-WP/93)

2.6.4.1 The requirement for the limited quantity mark to be reproduced on the outside of an overpack containing dangerous goods in limited quantities was included in Part 3;4.5.3. It was suggested it should also appear with the marking of overpack requirements in Part 5, since shippers and others using the Instructions generally only referred to this part when considering the marking requirements for packages and overpacks. Accordingly, an amendment to Part 2;2.4.10 was proposed.

2.6.4.2 The amendment was agreed, subject to a small editorial revision.

2.7 AMENDMENTS TO PART 6 OF THE TECHNICAL INSTRUCTIONS: PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS**2.7.1 Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 6 (DGP/23-WP/9)**

2.7.1.1 The meeting reviewed amendments to Part 6 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.7.1.2 The amendments were agreed, subject to an editorial amendment in Table 6-2 and the addition of a maximum net mass for metal, other than steel or aluminium.

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

2.8.1 **Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 7 (DGP/23-WP/10)**

2.8.1.1 The meeting reviewed amendments to Part 7 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.8.1.2 Some panel members had difficulties with the use of the word “storage” under the new visibility of markings and labels requirement in 7;2.6. Using the term would cause difficulties in many States since it was used in State legislation not related to air transport. A revision to the requirement to remove this conflict was supported. It was suggested that the title of Chapter 2 should be reconsidered at a later time, noting that “storage” was part it.

2.8.2 **Operator Acceptance Responsibilities (DGP/23-WP/24) and Definitions for the Terms “Undeclared” and “Misdeclared” Dangerous Goods (DGP/23-WP/46) and “Undeclared” and “Misdeclared” Dangerous Goods (DGP/23-WP/50)**

2.8.2.1 A proposal to add definitions for “misdeclared” and “undeclared” was agreed at DGP-WG/11. It was felt that including the definitions would be useful, as there were a number of references to the terms in the Instructions yet their meanings were never explained. The terms were defined in terms of either the absence of a dangerous goods transport document (undeclared) or the presence of a dangerous goods transport document but which had been erroneously prepared (misdeclared). Dangerous goods which were found during the acceptance check to not comply with the Technical Instructions were also included in the definition for misdeclared. The definitions were included in DGP/23-WP/4.

2.8.2.2 Although the definitions were agreed at DGP-WG/11, some members felt that documentation or lack thereof was an insufficient basis to fully define the terms and that adding the definitions to the Technical Instructions would potentially conflict with the recommended practice for the operator in Part 7;1.1.2. Although these members felt that definitions were not necessary, new definitions were proposed which it was felt would not conflict with regulatory approaches in some States and which included other indications that a consignment might contain undeclared or misdeclared dangerous goods.

2.8.2.3 The view of the Secretariat was that including such definitions in Part 1 of the Technical Instructions might have the consequential effect of having contradictory requirements in the Instructions, particularly with regard to “undeclared” dangerous goods. On the one hand, it was recommended that operators, under Part 7;1 of the Technical Instructions, should “seek confirmation from shippers about the contents of any item of cargo where there are suspicions that it may contain dangerous goods” whereas on the other, relief could be provided to the operator from this requirement through the use of this definition. Noting that the original intent of the proposal was to provide guidance to operators on the reporting requirements, it was suggested these definitions could be included in the form of a note to Part 7;4.5, but that it would be preferable to delete them. If deleted, it was suggested that the note which had been agreed provisionally at DGP-WG/11 should then be transferred to 7;4.5. This note addressed concerns from

some members of cases where reporting should not be considered critical, such as when a consignment is returned to a shipper for minor corrective action.

2.8.2.4 Some members had a different view and it was stressed the definitions in no way conflicted with the recommended practice of 7;1.1.2 for an operator to seek confirmation from shippers that suspicious packages did not contain dangerous goods. The view was expressed that it was extremely unfair on an operator to suggest that dangerous goods in a package marked with no more than a UN number, possibly in a small font size, and possibly offered for transport amongst many other packages containing non-dangerous goods, had been “declared” to them. Others felt that the training requirements in Part 7;1.1.1 and Part 1;4 (specifically the functions listed in Tables 1-4 and 1-5) implied that the operator did have a level of responsibility that would be diminished should the definitions remain.

2.8.2.5 The majority supported removing the definitions. The proposal was agreed.

2.8.2.6 DGP/23-WP/46 was withdrawn.

2.8.3 **Proposal to Require Organizations or Enterprises Offering Services for ‘Excess Baggage’ to Seek Confirmation About Dangerous Goods which are not Permitted in Passengers’ Baggage (DGP/23-WP/40)**

2.8.3.1 A new requirement in Part 7;5.2 was proposed which would require an operator or anyone acting on the operator’s behalf accepting excess baggage consigned as cargo to seek confirmation from the person or organization offering the excess baggage that it did not contain dangerous goods which were not permitted.

2.8.3.2 There was support for the intent of the proposal. Some felt the requirement would be difficult or impossible to implement as written, as passengers would not necessarily be in direct contact with the operator accepting the excess baggage. Making the provision a recommendation was felt to be more appropriate. It was suggested that reference to the operator and handling agent be removed, as this was covered under 7;5.1.2. The amendment was agreed, as amended.

2.8.4 **Dangerous Goods Occurrence Reports (DGP/23-WP/47)**

2.8.4.1 An extension to the reporting requirements of Part 7;4.4 of the Technical Instructions was proposed at DGP-WG/11 to include occurrences where dangerous goods had been carried without being properly loaded (e.g. inadequate segregation, separation, securing) or without written information having been provided to the pilot-in-command. The proposal was agreed in principle, although two issues were raised which needed further consideration, namely the inclusion of reports regarding non-compliance with Part 7;3 (Inspection and Decontamination) and to whom such reports should be made.

2.8.4.2 A new proposal was presented to the meeting addressing these issues. With regard to whom such reports should be made, it was suggested that all such reports would be of interest to the State of the Operator. With regard to dangerous goods which had been improperly loaded, or had not been notified to the pilot-in-command, it was suggested these issues were primarily of interest to the State of Origin since any remedial actions would need to take place in that State. The State of destination was suggested to be the best placed to address occurrences related to non-compliances with Part 7;3.

2.8.4.3 There was support for the proposal, although some questioned how it would be implemented practically. It was noted that operators would be more willing to report if a non-punitive system was in place. Without this, the potential for operators to be discouraged from self auditing could ensue. There were differing opinions on whether reporting to the State of Origin was necessary. Most felt that this would be beneficial in that it would alert States to operators which might need inspection.

2.8.4.4 Two alternative options were provided to the panel, the difference being structural. The second alternative was agreed, subject to the removal of the requirement to report occasions when Part 7;3 was not complied with (Inspection and Contamination) as this was felt to be excessive.

2.8.5 **Handling and Loading of Intermediate Bulk Containers (DGP/23-WP/56)**

2.8.5.1 It was noted that separate marking requirements were applicable to IBCs capable of being stacked and IBCs not capable of being stacked (6;2.4.3). There were, however, no corresponding operator requirements for handling and loading of these IBCs. A proposal to add requirements to Part 7;2 was therefore discussed.

2.8.5.2 The amendment was agreed, subject to the addition of the words “if present” to the end of the sentence to allow for occasions when the markings were not present.

2.8.6 **Location Of Table 7-1 Segregation Between Packages (DGP/23-WP/61)**

2.8.6.1 A proposal to relocate Table 7-1 (Segregation between packages) from Part 7;1 (Acceptance Procedures) to Part 2 (Storage and Loading) between paragraphs 2.2.1 and 2.2.2 was agreed. It was argued that the table was most often used when ensuring that incompatible packages were not stored or loaded next to each other, making the new position a more logical one and locating it more instinctive.

2.8.7 **Maintaining a Record of Aircraft Decontamination (DGP/23-WP/84)**

2.8.7.1 Although Part 7;3.1.3 of the Instructions requires operators to remove any hazardous contamination on board an aircraft, there is no requirement to document such decontamination. Accordingly, the meeting considered a proposal to require operators to maintain a record of hazardous decontamination actions on board an aircraft.

2.8.7.2 Although the intent of the proposal was supported, some felt the mandatory status would be difficult to implement. Others felt that making the provision a recommendation would not address the issue. It was noted that currently, only spills and leaks which could affect the airworthiness of an aircraft were recorded.

2.8.7.3 Panel members were encouraged to discuss how this requirement could be practically implemented within their States over the next biennium. Although the proposal could not be agreed at this time, it would be revisited.

2.8.8 **Notification To Competent Authority**
 (DGP/23-WP/94)

2.8.8.1 Part 5;1.2.1.4 b) of the Technical Instructions requires shippers to notify competent authorities when shipping certain consignments of high activity radioactive material. The competent authorities which must be notified are the country of origin of the shipment and the competent authority of each country through or into which the consignment will be transported.

2.8.8.2 Many States have variations requiring operators to obtain an approval and/or to notify civil aviation authorities of shipments of high activity radioactive material by air to, from, through and/or over their territory. Recent discussions were held in Europe between the European Aviation Safety Agency (EASA) and European civil aviation authorities on State variations and their impact on operators required to operate under the EU-OPS Regulations. State variations published by the CAA of a State falling under EU-OPS were not permitted to be more restrictive than the EU-OPS Regulations or the Technical Instructions. The effect of this will be that some variations will be removed and the additional requirements they had contained might disappear unless they are incorporated in the Technical Instructions.

2.8.8.3 A proposal adding an operator requirement to notify the competent authorities of the States of Origin, destination, transit and overflight of shipments of high activity levels of radioactive material was presented. Notification would be required for the same types of shipment of radioactive material which currently require notification from the shipper to the competent authorities.

2.8.8.4 An amendment requiring the shipper to make prior arrangements with the operator for such shipments was also proposed, recognizing that this would be necessary in order for the operator to comply with its notification requirements.

2.8.8.5 There was little support for the proposal, as it would place too much unnecessary burden on the operator and could result in complications which might result in an increase in denials of shipment. States concerned would have already been notified by the shipper.

2.8.8.6 The amendment was not agreed.

2.8.9 **Clarification of Accessibility Requirements for**
 Dangerous Goods Permitted Only on Cargo Aircraft
 (DGP/23-WP/98)

2.8.9.1 Exceptions from the loading on cargo aircraft requirements in Part 7;2.4.1.2 were causing confusion in that it was unclear if the hazard classes referred to subsidiary risks or only primary risks. It was noted that the main intent of the exception was to allow for certain classes of dangerous goods to be stowed away from the crew if exposure to them would be harmful. The panel was grateful for the proposal, as it was felt clarification was necessary. A revised proposal was agreed.

2.8.10 **Recognition of Undeclared Dangerous Goods**
 (DGP/23-WP/99)

2.8.10.1 The panel had discussed at DGP/22, DGP-WG/10 and DGP-WG/11 the risks associated with undeclared dangerous goods. It had been noted that the provisions in Part 7;6 were meant as an aid in recognizing undeclared dangerous goods. Attempts were made at the previous meetings to incorporate

text in the Instructions which would encourage shippers or operators to ensure consignments did not contain anything listed in 7;6. Noting that the list was an indicative one, finding a way to refer to the list without creating a new requirement for shippers and/or operators proved difficult. It was generally felt that this type of a requirement would be inappropriate for shippers who did not ship dangerous goods and would put an intolerable burden on operators.

2.8.10.2 A new proposal was presented to DGP/23 in the form of a note to 7;1.1.2. The note would recommend that operator acceptance staff check shipping documents with the general description on the air waybill and, if anything was suspicious, request documentary evidence from the shipper that the shipment did not contain dangerous goods.

2.8.10.3 The panel supported the proposal, recognizing that the new text was not mandatory and appreciating the additional guidance it provided.

2.8.10.4 The amendment was agreed, subject to an editorial amendment to add clarity.

2.9 AMENDMENTS TO PART 8 OF THE TECHNICAL INSTRUCTIONS: GENERAL

2.9.1 Draft amendments of the Technical Instructions to Align to the UN Recommendations — Part 8 (DGP/23-WP/11)

2.9.1.1 The meeting reviewed amendments to Part 8 of the Technical Instructions to reflect the decisions taken by the UN Committee of Experts at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

2.9.1.2 The amendments were presented in a new tabulated structure proposed and discussed at DGP-WG/10 and DGP-WG/11. The structure presented the provisions for passengers and crew in a more practical and user-friendly format. An additional column referring to dangerous goods permitted on one's person was added, and the group was asked to review the values provided in that column for each provision. It was suggested that a definition for the term "on one's person" should be considered, this would be revisited at a later time.

2.9.1.3 It was noted that other amendments to Part 8 had been adopted at DGP/23 but were not presented in the new tabulated format. The Secretariat would ensure all amendments were incorporated in the new format.

2.9.1.4 Square brackets had inadvertently been retained around "lithium alloy" in 8;1.1.2 y) of the 2011-2012 Edition. It was agreed the brackets and the text could be removed, noting that lithium alloy was a subset of lithium metal.

2.9.1.5 It was noted that the references to the IEC standards for fuel cells would include "Amendment 1" in square brackets, pending the outcome of IEC member country balloting.

2.9.2 **Battery Powered Devices Containing Non-Spillable Batteries (DGP/23-WP/16)**

2.9.2.1 It was suggested that Special Provision A67 currently implied that passengers were permitted to carry non-spillable batteries if the batteries met the requirements of that provision. The current amendment to this special provision proposed in DGP/23-WP/54, however, would make it clear that the special provision only applied to cargo. A proposal to add a provision to Part 8 for small non-spillable lead acid batteries was therefore presented to the panel.

2.9.2.2 The proposal was supported in principle, but a number of comments were raised:

- a) it was suggested that wording of the requirement to protect from short circuit and inadvertent activation be modified for the sake of consistency with other provisions in the Instructions;
- b) it was questioned whether reference to watt hours was appropriate, as this was not always marked;
- c) provision for spares should be addressed with a reference to Special Provision A67;
- d) whether or not the devices were for personal use should be taken into account.

2.9.2.3 A revised amendment to address these concerns was agreed, subject to editorial amendments which would be incorporated by the Secretariat.

2.9.3 **Heat Producing Articles (DGP/23-WP/55)**

2.9.3.1 An amendment to the provision for passengers to carry battery-powered equipment capable of generating extreme heat was proposed. It was noted that one of the conditions for this provision was that the heat producing component or the battery must be packed separately so as to prevent activation during transport. It was suggested that the use of the terminology “packed separately” could be interpreted to mean that the items had to be packed in separate bags and that this could cause damage to some equipment such as expensive underwater diving torches. This type of equipment was typically transported in specially-made carrying bags with provision made for the battery to be physically disconnected and protected against short circuit and carried in the bag with the other components of the equipment. It was suggested that this was a safe practice and the provision should be clarified to avoid confusion.

2.9.3.2 The amendment was agreed, subject to the addition of examples for preventing short circuit. These would be reproduced by the Secretariat from 1.1.2 h).

2.9.4 **Wheelchairs and Other Mobility Aids Powered by Batteries (DGP/23-WP/57)**

2.9.4.1 An amendment to the passenger provisions for wheelchairs and other mobility aids was proposed with the intent of addressing three issues. The first was to address wheelchairs found activated after flight. It was suggested that guaranteeing that activation did not occur might not be possible unless devices were carried within a ULD or compartment loaded with no other baggage or cargo, something which would be difficult if not impossible to apply by operators. New requirements were proposed to

address this issue. The second related to the absence of a reference to mobility aids powered by nickel-metal hydride batteries, even though Special Provision A123 addressed the requirements for transporting them. Reference to Special Provision A123 was added in the proposal. The third addressed wheelchairs and other mobility aids specifically designed to allow batteries to be removed and carried within a bag. It was suggested that these batteries would be safest if carried within the passenger cabin as this would allow intervention by crew in the event of short-circuit or fire. A requirement for this was added to the proposal.

2.9.4.2 The amendment was revised and discussed in conjunction with proposals in DGP/23-WP/75, Revised (see paragraph 5.1.8 and DGP/23-WP/80 (see paragraph 5.1.9). It was agreed, subject to editorial amendments and clarification that when applicable, the battery must be removed by the user.

2.9.5 **Avalanche Rescue Backpack (DGP/23-WP/62)**

2.9.5.1 An amendment to the avalanche rescue backpack provision was proposed to address advances in technology. It was reported that new avalanche airbags used a mechanical system with cables and springs which presented a lower risk in transport than the pyrotechnic triggers traditionally used. The amendment would allow for avalanche rescue backpacks equipped with or without pyrotechnic triggers. The amendment also addressed larger capacity cylinders currently being manufactured by specifying a quantity of energy limit instead of a water capacity limit.

2.9.5.2 It was questioned whether the energy limit was necessary; since the product would be worn, the design of the product would preclude large cylinders. A revised amendment was agreed.

2.9.6 **Pre-Mixing Burner Lighters (DGP/23-WP/79)**

2.9.6.1 The meeting was informed of an incident on an aircraft involving a blue-flame type lighter which ignited after being accidentally activated. The lighter had fallen in the recliner mechanism of a seat; when the seat was returned to the upright position, a nut of the seat recliner mechanism compressed the ignition device of the lighter causing blue flames which burned the seat cover. The flame height was approximately 1.5 m. Fortunately, no injuries resulted.

2.9.6.2 Discussions on forbidding blue flame lighters were held at DGP/22. Concern was raised at that time that it would be difficult for passengers to make a distinction between so-called “blue flame” lighters and regular ones. It was suggested that more information be included in the passenger provisions to describe them. Others felt that there were other types of similar devices which could be included as prohibited for carriage by passenger and crew and that perhaps more time should be spent addressing them all.

2.9.6.3 The meeting was presented with a new proposal forbidding “pre-mixed burner lighters such as jet and turbo lighters” from air transport. There was support for the proposal, but a few concerns were raised:

- a) The prohibition should be with the main provision (8;1.1.2 o)), not within a note. Although there was a note for “strike anywhere” matches, this was clarifying what was already indicated in Table 3-1 for UN 1331, **Matches ‘strike anywhere’**.
- b) Pre-mixed burner lighters was not a common term; it should be defined as a new entry in the Glossary.

The issues were addressed in a revised proposal. The amendment was agreed, subject to editorial amendments which would be incorporated by the Secretariat.

2.9.7 **AMENDMENTS TO THE ATTACHMENTS TO
THE TECHNICAL INSTRUCTIONS: GENERAL**

2.9.8 **Draft amendments to Attachment 2 of the Technical
Instructions (DGP/23-WP/12)**

2.9.8.1 The meeting reviewed amendments to Attachment 2 of the Technical Instructions (Glossary) to reflect proposals agreed by DGP-WG/10 and DGP-WG/11.

2.9.8.2 The amendments were agreed, subject to an editorial amendment.

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.

— — — — —

APPENDIX

PROPOSED AMENDMENTS TO THE TECHNICAL INSTRUCTIONS

FOREWORD

...

See paragraph 3.2.2 of DGP/23-WP/2:

USE OF THE TECHNICAL INSTRUCTIONS

The Technical Instructions are divided into eight Parts and supplemented by several attachments, with each Part and Attachment divided into Chapters and each Chapter divided into paragraphs and subparagraphs.

Within each Chapter, the Chapter number is incorporated into all of the paragraph numbers; thus, in Chapter 3, paragraph 2 carries the number "3.2". When referring to a paragraph, it is necessary to identify the appropriate Part or Attachment; if the above example were located in Part 2, the reference to it would be shown as "2;3.2" (that is, Part 2; Chapter 3, paragraph 3.2). If the above example were located in Attachment 3, the reference to it would be shown as "A3;3.2" (that is, Attachment 3; Chapter 3, paragraph 3.2).

Figures and Tables are numbered sequentially within the Part or Attachment in which they appear. Thus the second figure appearing in Part 4 is identified as "Figure 4-2" and, the first table appearing in Part 3 is identified as "Table 3-1" and the first table appearing in the attachments is identified as "Table A-1" and it appears in Attachment 3.

...

See paragraph 3.2.12 of DGP/23-WP/3:

ABBREVIATIONS AND SYMBOLS

The abbreviations and symbols in the following table are used throughout the Instructions, or in the particular sections indicated, and have the meanings shown below.

<i>Abbreviation or symbol</i>	<i>Meaning</i>
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...

G	gross mass as prepared for transport (as used in columns 11 <u>and 13</u> of Table 3-1)
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...

Part 1

GENERAL

Chapter 1

SCOPE AND APPLICABILITY

...

See paragraph 2.2.1 of this report:

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](#)), the contents of which are:

Part I. Classification procedures, test methods and criteria relating to explosives of Class 1;

Part II. Classification procedures, test methods and criteria relating to self-reactive substances of Division 4.1 and organic peroxides of Division 5.2; and

Part III. Classification procedures, test methods and criteria relating to substances or articles of Class 2, Class 3, Class 4, Division 5.1, Class 8 and Class 9.

Appendices. Information common to a number of different types of tests and national contacts for test details.

The amendments to the general applicability of approvals and exemptions Standards in Annex 18 which were agreed at DGP/22 were subsequently modified. Amendments to align the text in the Instructions with Amendment 10 to Annex 18 are included in this chapter.

See paragraph 5.3.1 of this report:

1.1 GENERAL APPLICABILITY

1.1.1 These *Technical Instructions for the Safe Transport of Dangerous Goods by Air*, referred to herein as the “Instructions”, prescribe the detailed requirements applicable to the international civil transport of dangerous goods by air [by any aircraft \(including both internal and external carriage\)](#). Any addenda to this edition of the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air* issued by ICAO constitute part of these Instructions.

See paragraph 2.2.1 of this report:

1.1.2 Where specifically provided for in these Instructions, the ~~State of Origin and the State of the Operator~~ [States concerned](#) may grant an approval:

~~—a) to transport dangerous goods forbidden on passenger and/or cargo aircraft where these Instructions state that such goods may be carried under an approval; or~~

~~—b) for other purposes as specified in these Instructions;~~

provided that in such instances an overall level of safety in transport which is ~~at least~~ equivalent to the level of safety provided for in these Instructions is achieved.

1.1.3 In instances:

~~a) of extreme urgency; or~~

~~b) when other forms of transport are inappropriate; or~~

c) when full compliance with the prescribed requirements is contrary to public interest,

the States concerned may grant an exemption from the provisions of the Instructions provided that in such instances ~~an every effort is made to achieve an~~ overall level of safety in transport which is ~~at least~~ equivalent to the level of safety provided for in these Instructions ~~is achieved. For the purposes of exemptions, "States concerned" are the States of Origin, Operator, transit, overflight and destination.~~

1.1.4 For the State of overflight, if none of the criteria for granting an exemption are relevant, an exemption may be granted based solely on whether it is believed that an equivalent level of safety in air transport has been achieved.

Note 1.— For the purpose of approvals, "States concerned" are the States of Origin and the Operator, unless otherwise specified in these Instructions.

Note 2.— For the purpose of exemptions, "States concerned" are the States of Origin, Operator, Transit, Overflight and Destination.

Note 3.— Guidance for the processing of exemptions, including examples of extreme urgency, may be found in the Supplement to the Technical Instructions (Part S-1;1.2 and 1.3).

Note 4.— Refer to 1;2.1 for dangerous goods forbidden for transport by air under any circumstance.

See paragraph 5.3.1 of this report:

Note 5.— Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, some additional considerations need to be made when dangerous goods are carried by helicopter, as described in 7;7.

1.1.4.5 General exceptions

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

...

c) for dropping in connection with agricultural, horticultural, forestry, avalanche control or pollution control activities;

...

Renumber paragraphs 1.1.4.2, 1.1.4.3 and 1.1.4.4 accordingly.

See paragraph 2.2.1 of this report:

1.3 APPLICATION OF STANDARDS

Where the application of a standard is required and there is any conflict between the standard and these Instructions, the Instructions take precedence.

Renumber subsequent paragraphs accordingly

...

Chapter 2

LIMITATION OF DANGEROUS GOODS ON AIRCRAFT

...

2.2 EXCEPTIONS FOR DANGEROUS GOODS OF THE OPERATOR

2.2.1 The provisions of these Instructions do not apply to the following:

...

See paragraph 2.2.5 of this report:

- b) aerosols, alcoholic beverages, perfumes, colognes, ~~safety matches and~~ liquefied gas lighters and portable electronic devices containing lithium metal or lithium ion cells or batteries provided that the batteries meet the provisions of 8.1.1.2 s) carried aboard an aircraft by the operator for use or sale on the aircraft during the flight or series of flights, but excluding non-refillable gas lighters and those lighters liable to leak when exposed to reduced pressure;

...

Chapter 3

GENERAL INFORMATION

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

3.1 DEFINITIONS

The amended definitions for “Approval” and “Exemption” in Annex 18 which were agreed at DGP/22 were subsequently modified. The following amendments align the text in the Instructions with Amendment 10 to Annex 18.

Approval. An authorization granted by the appropriate national authority for:

- a) ~~the transport of those entries listed in Table 3-1 as dangerous goods forbidden on passenger and/or cargo aircraft to which Special Provision A1 or A2 has been assigned in column 7 where the Technical Instructions state that such goods may be carried with an approval;~~ or
- b) other purposes as ~~specified~~ provided for in these ~~se~~ Technical Instructions.

Note.— In the absence of a specific reference in the Technical Instructions allowing the granting of an approval, an exemption may be sought.

...

Exemption. An authorization ~~issued, other than an approval, granted~~ by an appropriate national authority providing relief from the provisions of these ~~se~~ Technical Instructions.

Note.— The requirements for exemptions are given in 1;1.1.2.

...

See paragraph 5.3.1 of this report:

External carriage. Any load suspended from a helicopter or in equipment attached to a helicopter.

...

See paragraph 2.2.1 of this report:

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/R ~~Ev~~ ey.5 and Amend.1).

See paragraph 2.2.1.3 of this report:

Net quantity. The mass or volume of the dangerous goods contained in a package excluding the mass or volume of any packaging material, ~~except in the case of explosive articles and of matches where the net mass is the mass of the finished article excluding packagings. 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.~~

See paragraph 2.2.1 of this report:

Pressure receptacle. A collective term that includes cylinders, tubes, pressure drums, closed cryogenic receptacles, metal hydride storage systems ~~and~~, bundles of cylinders and salvage pressure receptacles.

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

Salvage pressure receptacle. (See UN Recommendations, Chapter 1.2). Not permitted for air transport.

See paragraph 3.2.3 of DGP/23-WP/3:

State of Destination. The State in the territory of which the consignment is finally to be unloaded from an aircraft.

An amendment for “State of Origin” was agreed at DGP/22. Since the definition appears in Annex 18, the amendment was not incorporated in the 2011-2012 Edition pending adoption by Council of Amendment 10 to Annex 18. The new definition will appear in the 2013-2014 Edition. A proposal to further amend the definition in order to align it with the new definition for State of Destination was supported at DGP/23 (see DGP/23-WP/3, paragraphs 3.2.2 and 3.2.3).

State of Origin. The State in the territory of which the ~~cargo consignment was~~ is first to be loaded on an aircraft.

...

Chapter 4

TRAINING

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

...

See paragraph 3.2.5 of DGP/23-WP/2:

4.2.3 Recurrent training must be provided within 24 months of previous training to ensure knowledge is current. However, if recurrent training is completed within the final three months of validity of previous training, the period of validity extends from the ~~date month~~ on which the recurrent training was completed until 24 months from the expiry ~~date month~~ of that previous training.

...

4.2.5 A record of training must be maintained which must include:

- a) the individual's name;
- b) the most recent training completion ~~date month~~;
- c) a description, copy or reference to training materials used to meet the training requirements;
- d) the name and address of the organization providing the training; and
- e) evidence which shows that a test has been completed satisfactorily.

Training records must be retained by the employer for a minimum period of 36 months from the most recent training completion ~~date month~~ and must be made available upon request to the employee or appropriate national authority.

...

See paragraph 3.2.4 of DGP/23-WP/3:

4.2.7 Staff of operators not carrying dangerous goods as cargo, ~~or~~ mail ~~or stores~~ 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 1-5.

See paragraph 2.2.4 of this report:

Note.— Security staff are required to be trained irrespective of whether the operator on which passenger or cargo is to be transported carries dangerous goods as cargo.

Table 1-4. Content of training courses

...

See paragraph 3.2.4 of DGP/23-WP/3 and paragraph 2.2.4 of this report:

KEY

- 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 ~~or stores~~ (other than dangerous goods)
- 5 — Staff of freight forwarders involved in the handling, storage and loading of cargo, ~~or~~ mail ~~or stores~~
- 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 ~~or stores~~ (other than dangerous goods)
- 8 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo, ~~or~~ mail ~~or stores~~ and baggage
- 9 — Passenger-handling staff
- 10 — Flight crew members, loadmasters and load planners
- 11 — Crew members (other than flight crew members)
- 12 — Security staff who are involved with the screening of passengers and their baggage and cargo, ~~or~~ mail ~~and stores~~, e.g. security screeners, their supervisors and staff involved in implementing security procedures

...

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

...

KEY

- 7 — Operator's and ground handling agent's staff accepting cargo, ~~or~~ mail ~~or stores~~ (other than dangerous goods)
- 8 — Operator's and ground handling agent's staff involved in the handling, storage and loading of cargo, ~~or~~ mail ~~or stores~~ (other than dangerous goods) and baggage
- 9 — Passenger handling staff
- 10 — Flight crew members, loadmasters and load planners
- 11 — Crew members (other than flight crew members)

...

See paragraph 5.7.1 of this report:

4.4 COMPETENCY-BASED TRAINING AND ASSESSMENT

Competency-based training and assessment should be used in accordance with the general provisions contained in Chapter 2 of the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868).

See paragraph 2.2.1.4 of this report:

Chapter 5

DANGEROUS GOODS SECURITY

Parts of this Chapter are affected by State Variation US 17; see Table A-1

5.1 GENERAL SECURITY PROVISIONS

...

5.1.3 The provisions of this chapter do not apply to:

a) UN 2908 and UN 2909 excepted packages;

b) UN 2910 and UN 2911 excepted packages with an activity level not exceeding the A_2 value; and

c) UN 2912 LSA-I and UN 2913 SCO-I.

...

5.3 Provisions for high consequence dangerous goods

5.3.1 Definition of high consequence dangerous goods

5.3.1.1 High consequence dangerous goods are those which have the potential for misuse in a terrorist event and which may, as a result, produce serious consequences such as mass casualties, mass destruction or, particularly for Class 7, mass socio-economic disruption.

5.3.1.2 An indicative list of high consequence dangerous goods in classes and divisions other than Class 7 is given in Table 1-6.

Table 1-6. Indicative list of high consequence dangerous goods

Class 1 Division 1.1 explosives
Class 1 Division 1.2 explosives
Class 1 Division 1.3 compatibility group C explosives
Class 1 Division 1.4 UN Nos. 0104, 0237, 0255, 0267, 0289, 0361, 0365, 0366, 0440, 0441, 0455, 0456 and 0500
Class 1 Division 1.5 explosives
Division 2.3 toxic gases (excluding aerosols)
Class 3 desensitized explosives
Division 4.1 desensitized explosives
Division 6.1 substances of Packing Group 1; except when transported under the excepted quantity provisions in 3;5
Division 6.2 infectious substances of Category A (UN Nos. 2814 and 2900)
Class 7 radioactive materials in quantities greater than 3000 A_1 (special form) or 3000 A_2, as applicable in Type B and Type C packages.

5.3.1.3 For dangerous goods of Class 7, high consequence radioactive material is that with an activity equal to or greater than a transport security threshold of 3 000 A_2 per single package (see also 2;7.2.2.1) except for the following radionuclides where the transport security threshold is given in Table 1-7 below.

Table 1-7. Transport security thresholds for specific radionuclides

<i>Element</i>	<i>Radionuclide</i>	<i>Transport security threshold (TBq)</i>
Americium	Am-241	0.6
Gold	Au-198	2
Cadmium	Cd-109	200
Californium	Cf-252	0.2
Curium	Cm-244	0.5
Cobalt	Co-57	7
Cobalt	Co-60	0.3
Caesium	Cs-137	1
Iron	Fe-55	8000
Germanium	Ge-68	7
Gadolinium	Gd-153	10
Iridium	Ir-192	0.8
Nickel	Ni-63	600
Palladium	Pd-103	900
Promethium	Pm-147	400
Polonium	Po-210	0.6
Plutonium	Pu-238	0.6
Plutonium	Pu-239	0.6
Radium	Ra-226	0.4
Ruthenium	Ru-106	3
Selenium	Se-75	2
Strontium	Sr-90	10
Thallium	Tl-204	200
Thulium	Tm-170	200
Ytterbium	Yb-169	3

5.3.1.4 For mixtures of radionuclides, determination of whether or not the transport security threshold has been met or exceeded can be calculated by summing the ratios of activity present for each radionuclide divided by the transport security threshold for that radionuclide. If the sum of the fractions is less than 1, then the radioactivity threshold for the mixture has not been met nor exceeded.

This calculation can be made with the formula:

$$\sum_i \frac{A_i}{T_i} < 1$$

Where:

A_i = activity of radionuclide i that is present in a package (TBq)

T_i = transport security threshold for radionuclide i (TBq).

5.3.1.5 When radioactive material possess subsidiary risks of other classes or divisions, the criteria of Table 1-6 should also be taken into account (see also 1;6.5).

5.34 SECURITY PLANS

5.34.1 Operators, shippers and others (including infrastructure managers) engaged in the transport of high consequence dangerous goods (see 5.3.1) should adopt, implement and comply with a security plan that addresses at least the elements specified in 5.34.2. High consequence dangerous goods are those which have the potential for misuse in a terrorist incident and which may, as a result, produce serious consequences such as mass casualties or mass destruction. An indicative list of high consequence dangerous goods is provided in Table 1-6.

Note.— When national authorities issue exemptions, they should consider all of the provisions in this Chapter.

5.34.2 The security plan should comprise at least the following elements:

- specific allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;
- records of dangerous goods or types of dangerous goods transported;
- review of current operations and assessment of vulnerabilities, including inter-modal transfer, temporary transit storage, handling, and distribution, as appropriate;

- d) clear statement of measures including training policies (including response to higher threat conditions, new employee/ employment verifications, etc.), operating practices (e.g. access to dangerous goods in temporary storage proximity to vulnerable infrastructure, etc.), equipment and resources that are to be used to reduce security risks;
- e) effective and up-to-date procedures for reporting and dealing with security threats, breaches of security or security incidents;
- f) procedures for the evaluation and testing of security plans and procedures for periodic review and update of the plans;
- g) measures to ensure the security of transport information contained in the plan; and
- h) measures to ensure that the security of the distribution of transport documentation is limited as far as possible. (Such measures must not preclude provision of the transport documentation required by Part 5, Chapter 4 of these Instructions.)

Note.— Operators, shippers and others with responsibilities for the safe and secure transport of dangerous goods should cooperate with each other and with appropriate authorities to exchange threat information, apply appropriate security measures and respond to security incidents.

5.45 RADIOACTIVE MATERIAL

For radioactive material, the provisions of this Chapter are deemed to be complied with when the provisions of the Convention on Physical Protection of Nuclear Material¹ and the IAEA circular on "The Physical Protection of Nuclear Material and Nuclear Facilities"² are applied.

...

See paragraph 2.2.3 of this report:

Chapter 7

INCIDENTS AND ACCIDENT REPORTING

Entities other than operators who are in possession of dangerous goods at the time a dangerous goods accident or incident occurs or at the time a dangerous goods incident is discovered to have occurred should follow the reporting requirements of Part 7:4.4. Entities other than operators who discover undeclared or misdeclared dangerous goods should follow the reporting requirements of Part 7:4.5. These entities may include, but are not limited to, freight forwarders, customs authorities and security screening providers.

...

Part 2

CLASSIFICATION OF DANGEROUS GOODS

INTRODUCTORY CHAPTER

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

...

See paragraph 2.3.1 of this report:

1. IAEA/INFCIRC/274/Rev.1, IAEA, Vienna (1980).

2. IAEA/INFCIRC/225/Rev.4 (Corrected), IAEA, Vienna (1999). See also "Guidance and Considerations for the Implementation of INFCIRC/225/Rev.4, the Physical Protection of Nuclear Material and Nuclear Facilities, IAEA-TECDOC-967/Rev.1.

3.5 A mixture or solution meeting the classification criteria of these Instructions composed of a single predominant substance identified by name in Table 3-1 and one or more substances not subject to these Instructions and/or traces of one or more substances identified by name in Table 3-1 must be assigned the UN number and proper shipping name of the predominant substance named in Table 3-1, unless:

- a) the mixture or solution is identified by name in Table 3-1 in which case this name must be applied; or
- b) the name and description of the substance named in Table 3-1 specifically indicates that it applies only to the pure substance; or
- c) the hazard class or division, subsidiary risk(s), physical state or packing group of the solution or mixture is different from that of the substance named in Table 3-1; or
- d) the hazard characteristics and properties of the mixture or solution necessitate emergency response measures that are different from those required for the substance identified by name in Table 3-1.

...

3.9 A mixture or solution meeting the classification criteria of these Instructions that is not identified by name in Table 3-1 and that is composed of two or more dangerous goods must be assigned to an entry that has the proper shipping name, description, hazard class or division, subsidiary risk(s) and packing group that most precisely describe the mixture or solution.

...

See paragraph 2.3.3 of this report:

5. Transport of samples

5.3 Samples of the substance must be transported in accordance with the requirements applicable to the tentative assigned proper shipping name provided:

- a) the substance is not considered to be a substance ~~prohibited~~ forbidden for transport by 1;2.1;

...

See paragraph 2.3.1 of this report:

Chapter 1

CLASS 1 — EXPLOSIVES

Parts of this Chapter are affected by State Variations BE 2, DQ 2, GB 1, HK 3, US 5; see Table A-1

...

1.1 DEFINITIONS AND GENERAL PROVISIONS

Class 1 comprises:

...

- b) explosive articles, except devices containing explosive substances in such quantity or of such a character that their inadvertent or accidental ignition or initiation during transport will not cause any effect external to the device either by projection, fire, smoke, heat or loud noise (see 1.5.2); and

...

1.3 DIVISIONS

1.3.1 Class 1 is divided into six divisions:

...

- f) Division 1.6 — Extremely insensitive articles which do not have a mass explosion hazard.

This division comprises articles which contain only extremely insensitive ~~detonating~~ substances and which demonstrate a negligible probability of accidental initiation or propagation.

Note.— The risk from articles of Division 1.6 is limited to the explosion of a single article.

See paragraph 2.3.3 of this report:

1.3.2 Any substance or article having or suspected of having explosive characteristics must first be considered for classification in Class 1 in accordance with the procedures in 1.5.1.1 to 1.5.1.3. Goods are not classified in Class 1 when:

- a) unless specially authorized, the transport of an explosive substance is ~~prohibited~~ forbidden because sensitivity of the substance is excessive;

...

See paragraph 2.3.1 of this report:

Table 2-2. Classification codes

<i>Description of substance or article to be classified</i>	<i>Compatibility group</i>	<i>Classification code</i>
...		
Articles containing only extremely insensitive detonating substances	N	1.6N
...		

...

1.5 CLASSIFICATION OF EXPLOSIVES

...

1.5.2.4 An article may be excluded from Class 1 when three unpackaged articles, each individually activated by its own means of initiation or ignition or external means to function in the designed mode, meet the following test criteria:

- a) no external surface has a temperature of more than 65°C. A momentary spike in temperature up to 200°C is acceptable;
- b) no rupture or fragmentation of the external casing or movement of the article or detached parts thereof of more than one metre in any direction;

Note.— Where the integrity of the article may be affected in the event of an external fire, these criteria must be examined by a fire test, such as described in ISO 12097-3.

- c) no audible report exceeding 135 dB(C) peak at a distance of one metre;
- d) no flash or flame capable of igniting a material such as a sheet of 80 ± 10 g/m² paper in contact with the article; and
- e) no production of smoke, fumes or dust in such quantities that the visibility in a one cubic metre chamber equipped with appropriately sized blow out panels is reduced more than 50 per cent as measured by a calibrated light (lux) meter or radiometer located one metre from a constant light source located at the midpoint on opposite walls. The general guidance on optical density testing in ISO 5659-1 and the general guidance on the photometric system described in Section 7.5 in ISO 5659-2 may be used or similar optical density measurement methods designed to accomplish the same purpose may also be employed. A suitable hood cover surrounding the back and sides of the light meter must be used to minimize effects of scattered or leaking light not emitted directly from the source.

Note 1.— If during the tests addressing criteria a), b), c) and d) no or very little smoke is observed, the test described in e) may be waived.

Note 2.— The appropriate national authority may require testing in packaged form if it is determined that, as packaged for transport, the article may pose a greater risk.

...

Chapter 2

CLASS 2 — GASES

*Parts of this Chapter are affected by State Variation US 6;
see Table A-1*

...

2.2 DIVISIONS

2.2.1 Substances of Class 2 are assigned to one of three divisions based on the primary hazard of the gas during transport.

*Note.— UN 1950 — **Aerosols**, UN 2037 — **Receptacles, small, containing gas** and UN 2037 — **Gas cartridges** must be regarded as being in Division 2.1 when the criteria in 2.5.1 a) are met.*

a) Division 2.1 — Flammable gases.

Gases which at 20°C and a standard pressure of 101.3 kPa:

- i) are ignitable when in a mixture of 13 per cent or less by volume with air; or
- ii) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. Flammability must be determined by tests or by calculation in accordance with methods adopted by ISO (see ~~ISO Standard 10156:1996~~ [ISO 10156:2010](#)). Where insufficient data are available to use these methods, tests by a comparable method recognized by the appropriate national authority must be used.

*Note.— UN 1950 — **Aerosols** and UN 2037 — **Receptacles, small, containing gas** must be regarded as being in Division 2.1 when the criteria in 2.5.1 a) are met.*

b) Division 2.2 — Non-flammable, non-toxic gases.

Gases which:

- i) are asphyxiant — gases which dilute or replace the oxygen normally in the atmosphere; or
- ii) are oxidizing — gases which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does; or
- iii) do not come under the other divisions.

Note.— In 2.2.1 b) ii), “gases which cause or contribute to the combustion of other material more than air does” means pure gases or gas mixtures with an oxidizing power greater than 23.5 per cent as determined by a method specified in ~~ISO 10156:1996 or 10156-2:2005~~ [ISO 10156:2010](#).

...

2.4 MIXTURES OF GASES

For the classification of gas mixtures into one of the three divisions (including vapours of substance from other classes), the following principles must be used:

- a) Flammability must be determined by tests or by calculation in accordance with methods adopted by ISO (see ~~ISO Standard 10156:1996~~ [ISO 10156:2010](#)). Where insufficient data are available to use these methods, tests by a comparable method recognized by the appropriate national authority may be used.

...

- d) Oxidizing ability is determined either by tests or by calculation methods adopted by the International Standards Organization (see the Note in 2.2.1 b) and ~~ISO 10156:1996~~ISO 10156:2010 and ~~ISO 10156-2:2005~~).

See paragraph 2.3.3 of this report:

2.5 AEROSOLS

2.5.1 For aerosols, the division of Class 2 and the subsidiary risks depend on the nature of the contents of the aerosol dispenser. The following provisions must apply:

...

- f) aerosols with contents meeting the criteria of Packing Group I for toxicity or corrosivity are ~~prohibited~~forbidden from transport.

...

Chapter 3

CLASS 3 — FLAMMABLE LIQUIDS

...

3.2 ASSIGNMENT OF PACKING GROUPS

See paragraph 2.3.2 of this report:

...

~~3.2.2 Viscous substances such as paints, enamels, lacquers, varnishes, adhesives and polishes having a flash point below 23°C may be placed in Packing Group III in conformity with the procedures prescribed in Part III, subsection 32.3, UN Manual of Tests and Criteria, on the basis of:~~

- ~~— a) the viscosity expressed as the flow time in seconds;~~
- ~~— b) the closed cup flash point;~~
- ~~— c) a solvent separation test; and~~
- ~~— d) the size of the receptacle.~~

3.2.3 ~~2~~ Criteria for inclusion in Packing Group III

Viscous flammable liquids such as paints, enamels, varnishes, adhesives and polishes with a flash point of less than 23°C ~~are included in Packing Group III~~ 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) less than 3 per cent of the clear solvent layer separates in the solvent separation test;
- b) the mixture or any separated solvent does not meet the criteria for Division 6.1 or Class 8;
- c) the viscosity and flash point are in accordance with Table 2-5;
- d) ~~the capacity of the receptacle used does not exceed 30 L~~when assigned to Packing Group III, the flammable liquids must not exceed a net quantity per package of 30 L for passenger aircraft or 100 L for cargo aircraft.

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

...

Chapter 5

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

...

See paragraph 3.2.1 of this report:

Table 2-7. List of currently assigned organic peroxides in packages

Note.— Peroxides to be transported must fulfil the classification and the control and emergency temperatures (derived from the self-accelerating decomposition temperature (SADT)) as listed.

Organic peroxide	Concentration (per cent)	Diluent type A (per cent)	Diluent type B (per cent) (Note 1)	Inert solid (per cent)	Water (per cent)	Control tempera- ture (°C)	Emergency tempera- ture (°C)	UN generic entry	Notes
...									
<u>([3r-(3r,5as,6s,8as,9r,10r,12s,12ar**)]- Decahydro-10-methoxy-3,6,9- trimethyl-3,12-epoxy-12h-pyrano[4,3- i]-1,2-benzodioxepin)</u>	<u>≤ 100</u>							<u>3106</u>	
Diacetone alcohol peroxides	≤57		≥26		≥8	+40	+45	3115	6
...									
Diisopropyl peroxydicarbonate	≤28 <u>≤32</u>	≥72 <u>≥68</u>				-15	-5	3115	
...									
<u>3,6,9-Triethyl-3,6,9-trimethyl-1,4,7- triperioxonane</u>	<u>≤ 17</u>	<u>≥ 18</u>		<u>≥ 65</u>				<u>3110</u>	
3,6,9-Triethyl-3,6,9-trimethyl-1,4,7- triperioxonane	≤42	≥58						3105	28

...

Chapter 6

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

...

6.3 DIVISION 6.2 — INFECTIOUS SUBSTANCES

...

6.3.2 Classification of infectious substances

...

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.

...

See paragraphs 3.2.7.1 b) and c) of DGP/23-WP/3 and paragraphs 2.3.1.5 and 2.3.5 of this report:

6.3.2.3.7 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.

6.3.2.3.7.1 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.

6.3.2.3.7.2 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.

...

Chapter 7

CLASS 7 — RADIOACTIVE MATERIAL

...

Table 2-12. Basic radionuclides values for individual radionuclides

See paragraph 2.3.4 of this report:

<i>Radionuclide (atomic number)</i>	<i><u>Special form</u> A₁ (TBq)</i>	<i><u>Other form</u> A₂ (TBq)</i>	<i>Activity concentration for exempt material (Bq/g)</i>	<i>Activity limit for an exempt consignment (Bq)</i>
---	--	--	--	--

Chapter 8

CLASS 8 — CORROSIVE SUBSTANCES

...

See paragraph 2.3.1 of this report:

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

<i><u>Packing Group</u></i>	<i><u>Exposure Time</u></i>	<i><u>Observation Period</u></i>	<i><u>Effect</u></i>
<u>I</u>	<u>≤ 3 min</u>	<u>≤ 60 min</u>	<u>Full thickness destruction of intact skin</u>
<u>II</u>	<u>> 3 min ≤ 1 h</u>	<u>≤ 14 d</u>	<u>Full thickness destruction of intact skin</u>

<u>III</u>	<u>> 1 h ≤ 4 h</u>	<u>≤ 14 d</u>	<u>Full thickness destruction of intact skin</u>
<u>III</u>	<u>==</u>	<u>==</u>	<u>Corrosion rate on either steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55 °C when tested on both materials</u>

...

Chapter 9

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

...

9.2 ASSIGNMENT TO CLASS 9

See paragraph 3.2.3.2 of DGP/23-WP/3 and paragraph 2.3.1.3 of this report:

9.2.1 Class 9 includes, inter alia:

- a) Environmentally hazardous substances (aquatic environment) are those that meet the criteria in 2.9.3 of the UN Model Regulations, ~~15th revised edition~~, or that meet criteria in international regulations or national regulations established by the appropriate national authority in the State of Origin, transit or destination of the consignment.

Substances or mixtures dangerous to the aquatic environment not otherwise classified under these Instructions must be assigned to Packing Group III and designated:

UN 3077 Environmentally hazardous substance, solid, n.o.s.; or
UN 3082 Environmentally hazardous substance, liquid, n.o.s.

...

See paragraph 3.2.23.1 c) of DGP/23-WP/3 and Corrigendum to the UN Model Regulations (Seventeenth revised Edition) (ST/SG/AC.10/1/Rev.17, July 2011):

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, sub-section 38.3. 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, sub-section 38.3 may continue to be transported;

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

- b) each cell and battery incorporates a safety venting device or is designed to preclude a violent rupture under conditions normally incident to transport;

- c) each cell and battery is equipped with an effective means of preventing external short circuits;

- d) each battery containing cells or series of cells connected in parallel is equipped with effective means as necessary to prevent dangerous reverse current flow (e.g. diodes, fuses, etc.);

- e) cells and batteries must be manufactured under a quality management programme that includes:

- 1) a description of the organizational structure and responsibilities of personnel with regard to design and product

quality:

-
- 2) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;
-
- 3) process controls that should include relevant activities to prevent and detect internal short circuit failure during manufacture of cells;
-
- 4) quality records, such as inspection reports, test data, calibration data and certificates. Test data must be kept and made available to the appropriate national authority upon request;
-
- 5) management reviews to ensure the effective operation of the quality management programme;
-
- 6) a process for control of documents and their revision;
-
- 7) a means for control of cells or batteries that are not conforming to the type tested in accordance with Part III, sub-section 38.3 of the UN *Manual of Tests and Criteria*;
-
- 8) training programmes and qualification procedures for relevant personnel; and
-
- 9) procedures to ensure that there is no damage to the final product.

Note.— In-house quality management programmes may be accepted. Third party certification is not required, but the procedures listed in 1) to 9) above must be properly recorded and traceable. A copy of the quality management programme must be made available to the appropriate national authority upon request.

...

Part 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

Chapter 1

GENERAL

...

1.3 MIXTURES OR SOLUTIONS

...

See paragraph 2.4.1 of this report:

1.3.2 A mixture or solution meeting the classification criteria of these Instructions composed of a single predominant substance identified by name in Table 3-1 and one or more substances not subject to these Instructions and/or traces of one or more substances identified by name in Table 3-1 must be assigned the UN number and proper shipping name of the predominant substance named in Table 3-1, unless:

- a) the mixture or solution is specifically identified by name in Table 3-1 in which case this name must be applied; or

...

1.3.4 A mixture or solution meeting the classification criteria of these Instructions that is not identified by name in Table 3-1 and that is composed of two or more dangerous goods must be assigned to an entry that has the proper shipping name, description, hazard class or division, subsidiary risk(s) and packing group that most precisely describe the solution or mixture.

...

Chapter 2

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

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

...

See paragraph 3.2.12 of DGP/23-WP/3 and 2.4.11.3 of this report:

Column 11 "Passenger aircraft — Maximum net quantity per package" — this column shows the maximum net quantity (mass or volume) of the article or substance allowed in each package for transport on a passenger aircraft. ~~The mass quoted is the net mass unless otherwise indicated by a letter "G"~~. Where a maximum net quantity appears beside a packing instruction prefixed by the letter "Y", this indicates it is the maximum net quantity permitted in a packaging containing limited quantities of dangerous goods unless indicated by a letter "G" where the mass quoted is the total mass of the package. The maximum quantity per package may be further limited by the type of packaging used. The maximum net quantities indicated may be exceeded only if specified in these Instructions or as permitted in the Supplement to these Instructions in S-3;2 with the approval of the appropriate national authority of the State of Origin and the State of the Operator.

Column 12 "Cargo aircraft — Packing instruction" — this column provides information similar to that in column 10, but for articles or substances which may be transported on a cargo aircraft only.

Column 13 "Cargo aircraft — Maximum net quantity per package" — this column provides information similar to that in column 11, but for articles or substances which may be transported on a cargo aircraft only. ~~The mass quoted is the net mass unless otherwise indicated by a letter "G"~~. The maximum quantity per package may be further limited by the type of packaging used. The maximum net quantities indicated do not apply to transport in portable tanks, as permitted in the Supplement to these Instructions, Part S-4, Chapter 12, with the approval of the appropriate authority of the State of Origin and the State of the Operator. The maximum net quantities indicated may be exceeded only if specified in these Instructions or as permitted in the Supplement to these Instructions in S-3;2 with the approval of the appropriate national authority of the State of Origin and the State of the Operator.

...

<i>Abbreviation</i>	<i>Column</i>	<i>Meaning</i>
G	11 and 13	Gross mass of package as prepared for transport

...

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

...

Chapter 3

SPECIAL PROVISIONS

*Parts of this Chapter are affected by State Variations AU 2, CA 7, CA 8,
GB 3, IR 3, JM 1, NL 1, US 11, ZA 1; see Table A-1*

...

Table 3-2. Special provisions

<i>TIs</i>	<i>UN</i>
See paragraph 3.2.9.1 a) of DGP/23-WP/3:	
A21	<p>This entry only applies to vehicles and equipment which are powered by wet batteries, sodium batteries, <u>lithium metal batteries</u> or lithium <u>ion</u> batteries and equipment powered by wet batteries or sodium batteries which are transported with these batteries installed.</p> <p><u>For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles and equipment are electrically-powered cars, lawn mowers, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, battery-assisted bicycles, wheelchairs, lawn tractors, boats and aircraft and other mobility aids. Examples of equipment are lawnmowers, cleaning machines or model boats and model aircraft.</u></p> <p><u>Equipment powered by lithium metal batteries or lithium ion batteries must be consigned under the entries UN 3091 Lithium metal batteries contained in equipment or UN 3091 Lithium metal batteries packed with equipment or UN 3481 Lithium ion batteries contained in equipment or UN 3481 Lithium ion batteries packed with equipment, as appropriate.</u></p> <p>Vehicles or equipment that also contain an internal combustion engine must be consigned under the entries <u>UN 3166 Engines, internal combustion, flammable gas powered or UN 3166 Engines, internal combustion, flammable liquid powered or UN 3166 Vehicle, flammable gas powered or UN 3166 Vehicle, flammable liquid powered</u>, as appropriate. Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, <u>lithium metal batteries</u> or lithium <u>ion</u> batteries, transported with the battery(ies) installed, must be consigned under the entries UN 3166 Vehicle, flammable gas powered or UN 3166 Vehicle, flammable liquid powered, as appropriate.</p> <p>Vehicles or equipment powered by a fuel cell engine must be consigned under the entries <u>UN 3166 Vehicle, fuel cell, flammable gas powered or UN 3166 Vehicle, fuel cell, flammable liquid powered, or UN 3166 Engine, fuel cell, flammable gas powered or UN 3166 Engine, fuel cell, flammable liquid powered</u>, as appropriate.</p>

2A-20

Appendix to the Report on Agenda Item 2

TIs UN

 See paragraphs 2.2.2 and 2.4.1 of this report:

- A32 Air bag inflators, air bag modules or seat-belt pretensioners ~~installed in conveyances or in completed conveyance components 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.

 See paragraph 2.3.3 of this report:

- A33 (103) Ammonium nitrites and mixtures of an inorganic nitrite with an ammonium salt are ~~prohibited~~ forbidden.
- A34 (113) The transport of chemically unstable mixtures is ~~prohibited~~ forbidden.
- A37 This entry is not intended to include Ammonium permanganate, the transport of which is ~~prohibited~~ forbidden under any circumstances.

 See paragraph 2.2.2 of this report:

- A41 Permeation devices that contain dangerous goods and that are used for calibrating air quality monitoring devices are not subject to these Instructions when carried as cargo provided the following requirements are met:
- a) Each device must be constructed of a material compatible with the dangerous goods it contains;
 - ...

 See paragraph 3.2.15 of DGP/23-WP/3 and paragraph 2.4.1.2 of this report:

- A44 The entry chemical kit or first aid kit is intended to apply to boxes, cases, etc., containing small quantities of ~~one or more compatible items 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.

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.
- ...

 See paragraph 2.4.14 of this report:

- A46 Mixtures of solids which are not subject to these Instructions and flammable liquids may be transported under this entry without first applying the classification criteria of Division 4.1, providing there is no free liquid visible at the time the substance is packaged and, for single packagings, the packaging must pass a leakproofness test at the Packing Group II level. Small inner packagings consisting of sealed packets or articles containing less than 10 mL of a Packing Group II or III flammable liquid absorbed into a solid material are not subject to these Instructions provided there is no free liquid in the packet or articles.

TIs UN

See paragraph 2.2.2 of this report:

- A47 (219) Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs) packed and marked in accordance with Packing Instruction 959 are not subject to any other requirements in these Instructions when carried as cargo.

If GMMOs or GMOs meet the definition in 2.6 of a toxic substance or an infectious substance and meet the criteria for inclusion in Division 6.1 or 6.2, the requirements in these Instructions for transporting toxic substances or infectious substances apply.

See paragraph 2.4.14 of this report:

- A50 Mixtures of solids which are not subject to these Instructions and toxic liquids may be transported under this entry without first applying the classification criteria of Division 6.1, providing there is no free liquid visible at the time the substance is packaged and, for single packagings, the packaging must pass a leakproofness test at the Packing Group II level. This entry must not be used for solids containing a Packing Group I liquid.

See paragraph 3.2.12 of DGP/23-WP/3 and paragraph 2.4.7 of this report:

- A51 Irrespective of the limit specified in column 11 of Table 3-1, aircraft batteries may be transported on passenger aircraft as follows:
- a) wet cell batteries, UN 2794 or UN 2795, up to a limit of 100 kg-gross net mass per package ~~may be transported~~;
 - b) lithium ion batteries, UN 3480, packages containing a single aircraft battery with a net mass not exceeding 35 kg; and
 - c) ~~T~~ transport in accordance with this special provision must be noted on the dangerous goods transport document.

See paragraph 2.2.2 of this report:

- A67 Non-spillable batteries meeting the requirements of Packing Instruction 872 are not subject to these Instructions when carried as cargo if, at a temperature of 55°C, the electrolyte will not flow from a ruptured or cracked case. The battery must not contain any free or unabsorbed liquid. Any electrical battery or battery powered device, equipment or vehicle having the potential of dangerous evolution of heat must be prepared for transport so as to prevent:

See paragraph 2.4.1 of this report:

- A68 (272) This substance must not be transported under the provisions of Division 4.1 unless specifically authorized by the appropriate national authority. (See UN 0143 or UN 0150 as appropriate.)

See paragraph 2.4.15 of this report:

- A69 The following are not subject to these Instructions when carried as cargo:
- a) articles 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.

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c) ~~Articles, 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 does not exceed is 1 g or less, are not subject to these Instructions when carried as cargo.~~

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

See paragraph 3.2.10 of DGP/23-WP/3 and paragraph 2.2.2 of this report:

A70 Internal combustion or fuel cell engines being shipped either separately or incorporated into a vehicle, machine or other apparatus, ~~the fuel tank of which has never contained any fuel and the fuel system of which is completely empty of fuel, or that are powered by a fuel that does not meet the classification criteria for any class or division, and~~ without batteries or other dangerous goods, are not subject to these Instructions when carried as cargo provided that:

a) for flammable liquid powered engines:

1) the engine is powered by a fuel that does not meet the classification criteria for any class or division; or

2) the fuel tank of the vehicle, machine or other apparatus has never contained any fuel or the fuel tank has been flushed and purged of vapours and adequate measures taken to nullify the hazard; and

3) the entire fuel system of the engine has no free liquid and all fuel lines are sealed or capped or securely connected to the engine and vehicle, machinery or apparatus.

~~b) for flammable gas powered internal combustion or fuel cell engines being shipped without batteries or other dangerous goods either separately or incorporated into a vehicle, machine or other apparatus that have contained fuel but:~~

1) the entire fuel system must have been flushed, purged and filled with a non-flammable gas or fluid to nullify the hazard ~~are not subject to these Instructions provided that:~~

2) the final pressure of the non-flammable gas used to fill the system does not exceed 200 kPa at 20°C

a3) the shipper has made prior arrangements with the operator; and

b4) the shipper has provided the operator with written or electronic documentation stating that the flushing, purging and filling procedure has been followed and that the final contents of the engine(s) have been tested and verified to be non-flammable; and.

~~c) the final pressure of the non-flammable gas used to fill the system does not exceed 200 kPa at 20°C.~~

Multiple engines may be shipped in a unit load device or other type of pallet provided that the shipper has made prior arrangements with the operator(s) for each shipment.

When this special provision is used, the words “not restricted” and the special provision number A70 must be provided on the air waybill when an air waybill is issued.

See paragraph 2.4.10 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 ~~must show no difference in burning rate~~ 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.

TIs UN

 See paragraph 2.4.14 of this report:

- A77 Mixtures of solids which are not subject to these Instructions and corrosive liquids may be transported under this entry without first applying the classification criteria of Class 8, providing there is no free liquid visible at the time the substance is packaged and, for single packagings, the packaging must pass a leakproofness test at the Packing Group II level.

 See paragraph 2.4.1 of this report:

- A94 Batteries or cells containing sodium must not contain dangerous goods other than ~~sodium, sulphur and/or polysulphides~~ sodium, sulphur or sodium compounds (e.g. sodium polysulphides and sodium tetrachloroaluminate). Batteries or cells must not be offered for transport at a temperature such that liquid elemental sodium is present in the battery or cell unless approved and under the conditions established by the appropriate national authority.

Cells must consist of hermetically sealed metal casings which fully enclose the dangerous goods and which are so constructed and closed as to prevent the release of the dangerous goods under normal conditions of transport.

Batteries must consist of cells secured within and fully enclosed by a metal casing so constructed and closed as to prevent the release of the dangerous goods under normal conditions of transport.

...

 See paragraph 2.2.2 of this report:

- A98 Aerosols, gas cartridges and receptacles, small, containing gas with a capacity not exceeding 50 ml, containing no constituents subject to these Instructions other than a Division 2.2 gas, are not subject to these Instructions when carried as cargo unless their release could cause extreme annoyance or discomfort to crew members so as to prevent the correct performance of assigned duties. The words "not restricted" and the special provision number A98 must be provided on the air waybill when an air waybill is issued.

 Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.10/1/Rev.17/Corr.1:

- A115 (280) This entry applies to articles which are used as lifesaving vehicle air bag inflators, or air bag modules or seat belt pretensioners, and which contain dangerous goods of Class 1 or dangerous goods of other classes and when transported as component parts and when 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 ~~vessel receptacle~~, no projection hazard and no thermal effect which would significantly hinder firefighting or other emergency response efforts in the immediate vicinity.

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See paragraph 2.4.17 of this report:

A117

The first and second sentences of the following special provision were reversed.

Wastes ~~infectious substances which can be specified~~ containing category A infectious substances must be assigned to UN 2814 or UN 2900. Wastes transported under UN 3291 are wastes ~~derived from the medical treatment of humans or animals or from bio-research, where there is a relatively low probability that infectious substances are present~~ containing infectious substances in Category B or wastes that are reasonably believed to have a low probability of containing infectious substances. Decontaminated wastes which previously contained infectious substances may be considered as not subject to these Instructions unless the criteria of another class or division are met.

See paragraph 2.2.2 of this report:

A129 (252) Provided the ammonium nitrate remains in solution under all conditions of transport, aqueous solutions of ammonium nitrate, with not more than 0.2 per cent combustible material, in a concentration not exceeding 80 per cent are not subject to these Instructions when carried as cargo.

...

See paragraph 2.4.1 of this report:

A134 (312) Vehicles or machinery powered by a fuel cell engine must be consigned under the entries UN 3166 **Vehicle, fuel cell, flammable gas powered** or UN 3166 **Vehicle, fuel cell, flammable liquid powered**, or UN 3166 **Engine, fuel cell, flammable gas powered** or UN 3166 **Engine, fuel cell, flammable liquid powered**, as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries ~~or lithium batteries~~, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

Other vehicles which contain an internal combustion engine must be consigned under the entries UN 3166 **Vehicle, flammable gas powered** or UN 3166 **Vehicle, flammable liquid powered**, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries ~~or lithium batteries~~, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

...

See paragraph 2.3.3 of this report:

A145 Waste aerosols are ~~prohibited~~ forbidden from air transport.

See paragraph 2.4.1 of this report:

A146 (328) This entry applies to fuel cell cartridges including when contained in equipment or packed with equipment. Fuel cell cartridges installed in or integral to a fuel cell system are regarded as contained in equipment. Fuel cell cartridge means an article that stores fuel for discharge into the fuel cell through a valve(s) that controls the discharge of fuel into the fuel cell. Fuel cell cartridges, including when contained in equipment, must be designed and constructed to prevent fuel leakage under normal conditions of transport.

Fuel cell cartridge design types using liquids as fuels must pass an internal pressure test at a pressure of 100 kPa (gauge) without leakage.

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Except for fuel cell cartridges containing hydrogen in metal hydride which must be in compliance with A162, each fuel cell cartridge design type, including fuel cell cartridges installed in or integral to a fuel cell system, must be shown to pass a 1.2 metre drop test onto an unyielding surface in the orientation most likely to result in failure of the containment system with no loss of contents.

When lithium metal or lithium ion batteries are contained in the fuel cell system, the consignment must be consigned under this entry and under the appropriate entries for UN 3091 Lithium metal batteries contained in equipment or UN 3481 Lithium ion batteries contained in equipment.

...

A161 (338) Each fuel cell cartridge transported under this entry and designed to contain a liquefied flammable gas must:

- a) be capable of withstanding, without leakage or bursting, a pressure of at least two (2) times the equilibrium pressure of the contents at 55°C;
- b) not contain more than 200 mL of liquefied flammable gas, ~~with a~~ the vapour pressure of which must not exceed ~~ing~~ 1 000 kPa at 55°C; and
- c) pass the hot water bath test prescribed in 6.5.4.1.

...

A176 (356) Metal hydride storage system(s) installed in ~~conveyances~~ vehicles, vessels or aircraft or in completed ~~conveyance~~ components or intended to be installed in ~~conveyances~~ vehicles, vessels or aircraft must be approved by the appropriate national authority before acceptance for transport. The dangerous goods transport document must include an indication that the package was approved by the appropriate national authority or a copy of the appropriate national authority approval must accompany each consignment.

...

See paragraph 2.3.3 of this report:

A183 Waste batteries and batteries being shipped for recycling or disposal are ~~prohibited~~ forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

See paragraph 2.4.1 of this report:

A184 (304) This entry may only be used for the transport of non-activated batteries which contain dry potassium hydroxide and which are intended to be activated prior to use by the addition of an appropriate amount of water to the individual cells.

A185 (360) Vehicles only powered by lithium metal batteries or lithium ion batteries must be consigned under the entry UN 3171 Battery-powered vehicle.

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:

- a) capacitors not installed in equipment must be transported in an uncharged state. Capacitors installed in equipment must be transported either in an uncharged state or protected against short circuit;
- b) each capacitor must be protected against a potential short circuit hazard in transport as follows:
 - i) when a capacitor's energy storage capacity is less than or equal to 10 Wh or when the energy storage capacity of each capacitor in a module is less than or equal to 10 Wh, the capacitor or module must be protected against short circuit or be fitted with a metal strap connecting the terminals; and

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ii) When the energy storage capacity of a capacitor or a capacitor in a module is more than 10 Wh, the capacitor or module must be fitted with a metal strap connecting the terminals;

c) capacitors containing dangerous goods must be designed to withstand a 95 kPa pressure differential;

See paragraph 2.4.1 of this report + Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.10/1/Rev.17/Corr.1:

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

See paragraph 2.4.1 of this report:

e) capacitors must be marked with the energy storage capacity in Wh.

Capacitors containing an electrolyte not meeting the classification criteria of any class or division of dangerous goods, including 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 10 Wh or less are not subject to other provisions of these Instructions when they 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 10 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 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.— Capacitors which by design maintain a terminal voltage (e.g. asymmetrical capacitors) do not belong to this entry.

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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:

i) the propellant;

ii) the liquid; or

iii) the solid.

If one of these components, which can be a pure substance or a mixture, needs to be classified as flammable, the chemical under pressure must be classified as flammable in Division 2.1. Flammable components are flammable liquids and liquid mixtures, flammable solids and solid mixtures or flammable gases and gas mixtures meeting the following criteria:

i) a flammable liquid is a liquid having a flashpoint of not more than 93°C;

ii) a flammable solid is a solid which meets the criteria in 2;4.2.2 of these Instructions;

iii) a flammable gas is a gas which meets the criteria in 2;2.2.1 of these Instructions;

b) gases of Division 2.3 and gases with a subsidiary risk of 5.1 must not be used as a propellant in a chemical under pressure;

c) where the liquid or solid components are classified as dangerous goods of Division 6.1, Packing Groups II or III, or Class 8, Packing Groups II or III, the chemical under pressure must be assigned a subsidiary risk of Division 6.1 or Class 8 and the appropriate UN number must be assigned. Components classified in Division 6.1, Packing Group I, or Class 8, Packing Group I, must not be used for transport under this proper shipping name;

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;

A188 (359) Nitroglycerin solution in alcohol with more than 1 per cent but not more than 5 per cent nitroglycerin must be classified in Class 1 and assigned to UN 0144 if not all the requirements of Packing Instruction 371 are complied with.

See paragraph 2.4.2 of this report:

A189 Except where the defining criteria of another class or division are met, concentrations of formaldehyde solution:

— with less than 25 per cent but not less than 10 per cent formaldehyde must be classified as UN 3334 **Aviation regulated liquid, n.o.s.**; and

— with less than 10 per cent formaldehyde are not subject to these Instructions.

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 See paragraph 2.4.5 of this report:

A191 Neutron radiation detectors containing non-pressurized boron trifluoride gas in excess of 1 gram and radiation detection systems containing such neutron radiation detectors as components may be transported on cargo aircraft in accordance with these Technical Instructions irrespective of the indication of "forbidden" in columns 12 and 13 of the Dangerous Goods List, provided:

- a) the pressure in each neutron radiation detector must not exceed 105 kPa absolute at 20°C;
- b) the amount of gas must not exceed 12.8 grams per detector and the amount per outer packaging or per radiation detection system must not exceed 51.2 grams;
- c) each neutron radiation detector must be of welded metal construction with brazed metal to ceramic feed through assemblies. They must have a minimum burst pressure of 1 800 kPa;
- d) each neutron radiation detector must be packed in a sealed intermediate plastic liner with sufficient absorbent material to absorb the entire gas contents. Neutron radiation detectors must be packed in strong outer packagings that are capable of withstanding a 1.8 meter drop test without leakage. Radiation detector systems containing neutron radiation detectors must also include 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. They must be packed in strong outer packagings unless neutron radiation detectors are afforded equivalent protection by the radiation detection system, and
- e) transport in accordance with this special provision need not be noted on the dangerous goods transport document and a packing instruction must not be shown on the transport document. The package must be labelled with "Toxic gas" and "Corrosive" subsidiary risk labels.

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 packed in accordance with the above conditions, are not subject to these Instructions irrespective of the indication of "forbidden" in columns 10 to 13. The words "not restricted" and the special provision number A191 must be provided on the air waybill when an air waybill is used.

 See paragraph 2.4.6 of this report:

A192 Notwithstanding the Division 6.1 subsidiary risk shown in column 4 of Table 3-1, the toxic subsidiary risk label and an indication of this subsidiary risk on the dangerous goods transport document are not required when the manufactured articles contain not more than 5 kg of mercury. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

 ...

Chapter 4

DANGEROUS GOODS IN LIMITED QUANTITIES

...

4.1 APPLICABILITY

...

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:

...

See paragraph 2.4.15 of this report:

Class 8	Packing Groups II and III but excluding UN 2794, UN 2795, UN 2803, UN 2809 and , UN 3028 <u>and UN 3506.</u>
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...

4.3 QUANTITY LIMITATIONS

4.3.1 The net quantity per package must not exceed the quantity specified in column 11 of Table 3-1 against the packing instruction number identified by the prefix letter "Y" in column 10.

4.3.2 The gross mass per package must not exceed 30 kg.

4.3.3 When different dangerous goods are contained in one outer packaging, the quantities of such dangerous goods must be so limited that:

See paragraph 3.2.12 of DGP/23-WP/2:

- a) for classes other than Classes 2 (except UN 2037, UN 3478 and UN 3479) and 9, the total net quantity in the package does not exceed the value of 1, where "Q" is calculated using the formula:

$$Q = \frac{n_1}{M_1} + \frac{n_2}{M_2} + \frac{n_3}{M_3} + \dots$$

where n_1 , n_2 , etc., are the net quantities of the different dangerous goods and M_1 , M_2 etc., are the maximum net quantities for these different dangerous goods shown in Table 3-1 against the relevant "Y" packing instructions; and

- b) for Classes 2 (except UN 2037, UN 3478 and UN 3479) and 9:
- 1) when packed together without goods of other classes, the gross mass of the package does not exceed 30 kg; or
 - 2) when packed together with goods of other classes, the gross mass of the package does not exceed 30 kg and the total net quantity in the package of goods other than in Classes 2 (except UN 2037, UN 3478 and UN 3479) or 9 does not exceed the value of 1 when calculated according to a) above.
- c) carbon dioxide, solid (dry ice), UN 1845 may be packed together with goods of other classes, provided that the gross mass of the package does not exceed 30 kg. The quantity of dry ice does not need to be taken into account in the calculation of the "Q" value. However, the packaging containing the carbon dioxide, solid (dry ice) and the outer packaging must permit the release of carbon dioxide gas.

4.3.4 Where the different dangerous goods in the outer packaging consist only of those with the same UN number, packing group and physical state (i.e. solid or liquid), the calculation in 4.3.3 a) does not need to be made. However, the total net quantity in the package must not exceed the maximum net quantity according to Table 3-1.

...

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.

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.

—Note.— Packages prepared for transport before 31 December 2010 using the limited quantity “Y” packing instructions from the 2009-2010 Edition of these Instructions may be presented for transport until 31 March 2011 without the mark shown in Figure 3-1. In this case the package must be marked “limited quantity(ies)” or “LTD QTY”.

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.

See paragraph 2.4.16 of this report:

4.6 PACKAGE LABELLING

4.6.1 Packages containing limited quantities must be labeled as required by the applicable paragraphs of 5;3.

4.7 DANGEROUS GOODS TRANSPORT DOCUMENT

4.7.1 The dangerous goods transport document must comply with all the requirements of 5;4.

See paragraph 2.4.13 of this report:

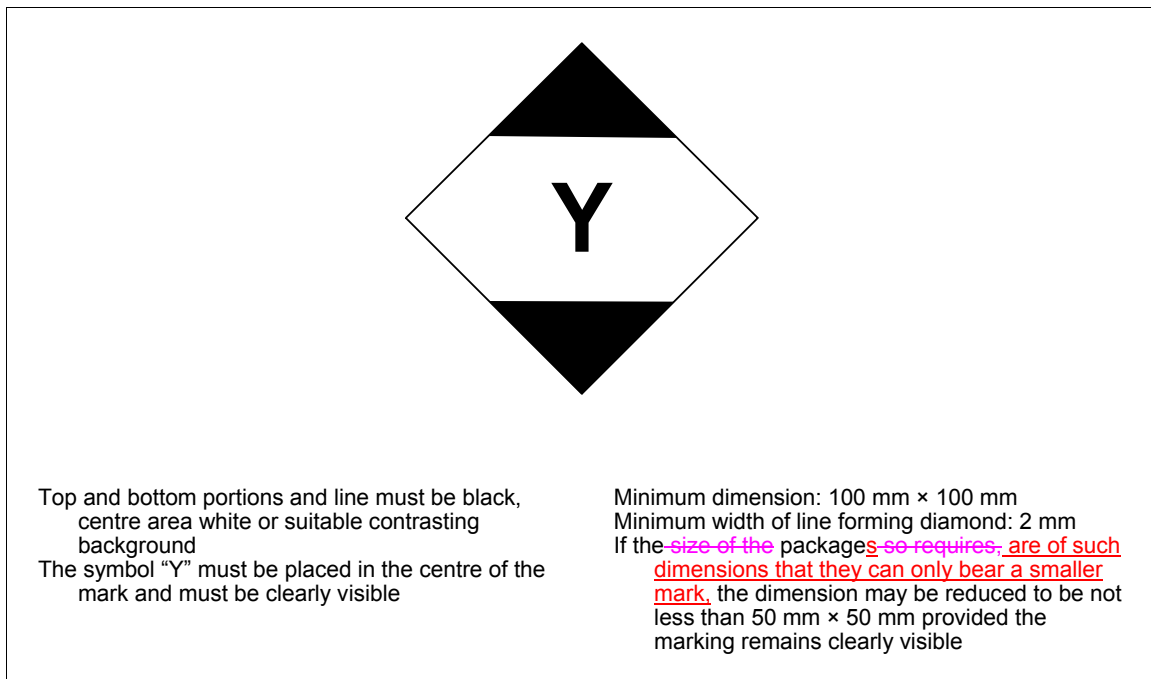


Figure 3-1. Limited quantities mark

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:

...

- f) the loading restriction in 7;2.1; and
- g) the reporting requirements of dangerous goods accidents, incidents and other occurrences in 7;4.4 and 7;4.5.

See paragraph 2.2.2 of this report:

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.

5.1.3 Where dangerous goods in excepted quantities for which different codes are assigned are packaged together, the total quantity per outer packaging must be limited to that corresponding to the most restrictive Code.

See paragraph 2.4.1.5 of this report:

5.6 DE MINIMIS QUANTITIES

Dangerous goods assigned to codes E1, E2, E4 or E5 are not subject to these Instructions when carried as cargo provided that:

- a) the maximum net quantity of material per inner packaging is limited to 1 mL for liquids and gases and 1 g for solids;
- b) the provisions of 3;5.2 are met, except that an intermediate packaging is not required if the inner packagings are securely packed in an outer packaging with cushioning material in such a way that, under normal conditions of transport, they cannot break, be punctured, or leak their contents; and for liquid dangerous goods, the outer packaging contains sufficient absorbent material to absorb the entire contents of the inner packagings;
- c) the provisions of 3;5.3 are complied with; and
- d) the maximum net quantity of dangerous goods per outer packaging does not exceed 100 g for solids or 100 mL for liquids and gases.

...

Part 4

PACKING INSTRUCTIONS

INTRODUCTORY NOTES

See paragraph 3.2.16 of DGP/23-WP/2:

Note 1.— Packing groups

For packing purposes, dangerous goods ~~of all classes~~, other than Classes 1, 2 and 7, self-reactive substances of Division 4.1, and Divisions 5.2 and 6.2, have been divided among three packing groups according to the degree of danger they present. The packing groups have the following meanings:

- Packing Group I — Substances presenting high danger
- Packing Group II — Substances presenting medium danger
- Packing Group III — Substances presenting low danger

Some substances in Class 9 and liquids in Division 5.1 have been assigned to packing groups by experience rather than through application of technical criteria. The packing group to which a substance is assigned is listed in Table 3-1. The criteria for the packing groups are given in Part 2, Chapters 3, 4, 5, 6 and 8.

...

See paragraph 3.2.26 of DGP/23-WP/3:

Note 7.— Carriage of oxygen and air with aquatic animals

With the approval of the appropriate authority of the State of Origin, of Destination and of the Operator, for the purpose of providing life support to aquatic animals during transport, ~~a~~ cylinders containing Oxygen compressed, UN 1072 or Air, compressed, UN 1002 may be carried to oxygenate the water in accordance with the provisions of Table S-3-1 and Special Provision A202 (which appear in the Supplement).

...

See paragraph 5.3.1 of this report:

Note 11.— Open external carriage

When dangerous goods are prepared for open external carriage (e.g. suspended from a helicopter or in open external carrying devices), consideration should be given to the type of packaging used and protection of those packagings where necessary from the effects of airflow and weather (e.g. by damage from rain or snow).

...

See paragraph 3.2.19 of DGP/23-WP/2:

1.1.4 The body and the closure of any packaging must be so constructed as to be able to adequately resist the effects of temperature and vibration occurring in normal conditions of transport. The closure device must be so designed that it:

- a) is unlikely that it can be incorrectly or incompletely closed, and must be such that it may be checked easily to determine that it is completely closed; and
- b) remains securely closed during transport.

1.1.4.1 In addition, for inner packagings containing liquids ~~substances~~, closures must be held securely, tightly and effectively in place by secondary means. Examples of such methods include: adhesive tape, friction sleeves, welding or soldering, positive locking wires, locking rings, induction heat seals and child-resistant closures. When secondary means of

closure cannot be applied ~~to an inner packaging containing liquids~~, the inner packaging must be securely closed and placed in a leakproof liner and then placed in an outer packaging.

...

See paragraph 3.2.12 of DGP/23-WP/3:

1.1.9 Subject to 1.1.8 an outer packaging may contain more than one item of dangerous goods provided that:

...

- e) the quantities of different dangerous goods contained in one outer packaging must be such that “Q” does not exceed the value of 1, where “Q” is calculated using the formula:

$$Q = \frac{n_1}{M_1} + \frac{n_2}{M_2} + \frac{n_3}{M_3} + \dots$$

where n_1 , n_2 , etc. are the net quantities of the different dangerous goods and M_1 , M_2 , etc. are the maximum net quantities for these different dangerous goods according to Table 3-1 for passenger or cargo aircraft as applicable. However, the following dangerous goods do not need to be taken into account in the calculation of the “Q” value:

- 1) carbon dioxide, solid (dry ice), UN 1845;
- 2) those where columns 11 and 13 of Table 3-1 indicate “No limit”;
- 3) those with the same UN number, packing group, and physical state (i.e. solid or liquid), providing they are the only dangerous goods in the package and the total net quantity does not exceed the maximum net quantity according to Table 3-1.

~~4) those where columns 11 and 13 of Table 3-1 indicate a maximum gross mass per package;~~

- ~~f) for packages containing dangerous goods where the letter “G” follows the quantity shown in column 11 or 13 of Table 3-1, the gross mass of the completed package does not exceed the lowest applicable gross mass;~~

An outer packaging containing Division 6.2 (Infectious Substances) may contain material for refrigeration, or freezing or packaging material such as absorbent material.

...

See paragraph 3.2.28 of DGP/23-WP/3:

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;3.2.11 b)~~ 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.

...

See paragraph 2.5.1 of this report:

1.1.13 Except as provided in 1.1.13.1, C combination packagings having inner packagings containing liquid dangerous goods, ~~excluding flammable liquids in inner packagings of 120 mL or less, or infectious substances in primary receptacles not exceeding 50 mL, or hermetically sealed inner packagings each containing not more than 500 mL,~~ must be packed so that the closures on the inner packagings are upward and the upright position of the package must be indicated on it by the “Package orientation” label described in 5;3.2.12 b). The words “This side up” or “This end up” may also be displayed on the top cover of the package.

1.1.13.1 Orientation arrows are not required on outer packagings containing:

a) dangerous goods in inner packagings each containing not more than 120 mL with sufficient absorbent material between the inner and outer packagings to completely absorb the liquid contents;

b) Division 6.2 infectious substances in primary receptacles each containing not more than 50 mL; or

See paragraph 2.5.5 of this report:

c) dangerous goods in gas tight inner packagings such as tubes, bags or vials which are opened by breaking or puncturing. Each inner packaging must not contain more than 500 mL.

The amendment to 1.1.13 proposed in paragraph 3.2.28 of DGP /23-WP/3 was incorporated in the 2011-2012 Edition through Addendum No. 3, Corrigendum No. 2

...

See paragraph 2.5.1 of this report:

1.1.21 Where ice is used as a coolant it must not affect the integrity of the packaging.

...

Chapter 2

GENERAL

...

2.3 Each instruction shows, where applicable, the acceptable single and combination packagings. For combination packagings, tables show the acceptable outer packagings and associated inner packagings with the maximum net quantity permitted in each inner packaging. Where provisions for particular articles or substances apply, a table shows the inner packagings with associated quantity limitations, the permitted quantity per package and, where applicable, an indication if single packagings are permitted. Where appropriate, additional packing requirements are also indicated at the end of a packing instruction. These additional packing requirements may impose a higher standard of packaging than would normally apply to the packing group, or may require specific packaging considerations.

~~—Note.—To assist shippers in the transition to the new packing instructions that become effective in this edition of these Instructions, packages prepared for transport before 31 December 2010 using packing instructions in the 2009-2010 Edition may be presented for transport until 31 March 2011. When this transitional provision is being used, the shipper must indicate on the dangerous goods transport document the packing instruction number in effect from the 2009-2010 Edition.~~

Chapter 3

CLASS 1 — EXPLOSIVES

...

3.4 PACKING INSTRUCTIONS

...

See paragraph 2.5.1 of this report:

Packing Instruction 114

a) solid wetted

Inner packagings

Bags
 plastics
 textile
 woven plastics
 Receptacles
 metal
 plastics
wood

Intermediate packagings

Bags
 plastics
 textile, plastic
 coated or lined
 Receptacles
 metal
 plastics
Dividing partitions
wood

Outer packagings

Boxes
 fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof
 walls (4C2)
other metal (4N)
 plywood (4D)
 reconstituted wood (4F)
 solid plastics (4H2)
 steel (4A)
 Drums
 aluminium, ~~removable head~~
(1B1, 1B2)
 fibre (1G)
other metal (1N1, 1N2)
 plastics, ~~removable head~~
(1H1, 1H2)
 plywood (1D)
 steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— For UN 0077, 0234, 0235 and 0236, packagings must be lead-free.

See paragraph 2.5.1 of this report and Corrigendum to UN
 Model Regulations (Seventeenth revised Edition)
 ST/SG/AC.10/1/Rev.17/Corr.1:

- For UN 0342, inner packagings are not required when metal (1A1, 1A2 ~~or, 1B1, 1B2, 1N1 or 1N2~~) or plastic (1H1 or 1H2) drums are used as outer packagings.
 — Intermediate packagings are not required if leakproof removable head drums are used as the outer packaging.

See paragraph 2.5.1 of this report:

b) solid dry*Inner packagings*

Bags

paper, kraft
 plastics
 textile, siftproof
 woven plastics, siftproof

Receptacles

fibreboard
 metal
 paper
 plastics
wood
 woven plastics, siftproof

*Intermediate
packagings*

Not necessary

Outer packagings

Boxes

fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof
 walls (4C2)
 plywood (4D)
 reconstituted wood (4F)

Drums

aluminium, ~~removable head~~
 (1B1, 1B2)
 fibre (1G)
other metal (1N1, 1N2)
 plastics, ~~removable head~~
 (1H1, 1H2)
 plywood (1D)
 steel, ~~removable head~~ (1A1,
 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0077, 0132, 0234, 0235 and 0236, packagings must be lead-free.
- For UN 0508 and 0509, metal packagings must not be used.
- For UN 0160 and 0161, when metal drums (1A1, 1A2 or 1B1, 1B2, 1N1 or 1N2) are used as the outer packaging, metal packagings must be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes, is prevented.
- For UN 0160 and 0161, inner packagings are not required if drums are used as the outer packaging.

Packing Instruction 130*Inner packagings*

Not necessary

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
 expanded plastics (4H1)
 fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof walls (4C2)
other metal (4N)
 plywood (4D)
 reconstituted wood (4F)
 solid plastics (4H2)
 steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
 fibre (1G)
other metal (1N1, 1N2)
 plastics, ~~removable head~~ (1H1, 1H2)
 plywood (1D)
 steel, ~~removable head~~ (1A1, 1A2)

...

Packing Instruction 131

Inner packagings

Bags
 paper
 plastics
 Receptacles
 fibreboard
 metal
 plastics
 wood
 Reels

Intermediate packagings

Not necessary

Outer packagings

Boxes
 aluminium (4B)
 fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof walls (4C2)
other metal (4N)
 plywood (4D)
 reconstituted wood (4F)
 steel (4A)
 Drums
 aluminium, ~~removable head~~ (1B1, 1B2)
 fibre (1G)
 plastics, ~~removable head~~ (1H1, 1H2)
other metal (1N1, 1N2)
 plywood (1D)
 steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— For UN 0029, 0267 and 0455, bags and reels must not be used as inner packagings.

Packing Instruction 133

Inner packagings

Receptacles
 fibreboard
 metal
 plastics
 wood
 Trays, fitted with dividing partitions
 fibreboard
 plastics
 wood

Intermediate packagings

Receptacles
 fibreboard
 metal
 plastics
 wood

Outer packagings

Boxes
 aluminium (4B)
 fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof walls (4C2)
other metal (4N)
 plywood (4D)
 reconstituted wood (4F)
 solid plastics (4H2)
 steel (4A)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— Receptacles are only required as intermediate packagings when the inner packagings are trays.
 — For UN 0043, 0212, 0225, 0268 and 0306, trays must not be used as inner packagings.

Packing Instruction 134

Inner packagings

Bags
 water-resistant
 Receptacles
 fibreboard
 metal
 plastics
 wood
 Sheets
 fibreboard, corrugated
 Tubes
 fibreboard

Intermediate packagings

Not necessary

Outer packagings

Boxes
 aluminium (4B)
 fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof walls (4C2)
 ~~other metal (4N)~~
 plywood (4D)
 reconstituted wood (4F)
 solid plastics (4H2)
 steel (4A)
 Drums
 aluminium, ~~removable head~~ (1B1, 1B2)
 fibre (1G)
 plastics, ~~removable head~~ (1H1, 1H2)
 ~~other metal (1N1, 1N2)~~
 plywood (1D)
 steel, ~~removable head~~ (1A1, 1A2)

Packing Instruction 135

Inner packagings

Bags
 paper
 plastics
 Receptacles
 fibreboard
 metal
 plastics
 wood
 Sheets
 paper
 plastics

Intermediate packagings

Not necessary

Outer packagings

Boxes
 aluminium (4B)
 expanded plastics (4H1)
 fibreboard (4G)
 natural wood, ordinary (4C1)
 natural wood, with siftproof walls (4C2)
 ~~other metal (4N)~~
 plywood (4D)
 reconstituted wood (4F)
 solid plastics (4H2)
 steel (4A)
 Drums
 aluminium, ~~removable head~~ (1B1, 1B2)
 fibre (1G)
 ~~other metal (1N1, 1N2)~~
 plastics, ~~removable head~~ (1H1, 1H2)
 plywood (1D)
 steel, ~~removable head~~ (1A1, 1A2)

Packing Instruction 136

Inner packagings

Bags

plastics
textile

Boxes

fibreboard
plastics
wood

Dividing partitions in the
outer packagings

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
other metal (4N)
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
other metal (1N1, 1N2)
plastics, ~~removable head~~ (1H1, 1H2)
plywood (1D)
steel, ~~removable head~~ (1A1, 1A2)

Packing Instruction 137

Inner packagings

Bags

plastics

Boxes

fibreboard
wood

Tubes

fibreboard
metal
plastics

Dividing partitions in the
outer packagings

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
other metal (4N)
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.

Packing Instruction 138

Inner packagings

Bags

plastics

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
~~other metal (4N)~~
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
~~other metal (1N1, 1N2)~~
plastics, ~~removable head~~ (1H1, 1H2)
plywood (1D)
steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- If the ends of the articles are sealed, inner packagings are not necessary.

Packing Instruction 139

Inner packagings

Bags

plastics

Receptacles

fibreboard
metal
plastics
wood

Reels

Sheets

paper
plastics

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
~~other metal (4N)~~
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
~~other metal (1N1, 1N2)~~
plastics, ~~removable head~~ (1H1, 1H2)
plywood (1D)
steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0065, 0102, 0104, 0289 and 0290, the ends of the detonating cord must be sealed, for example by a plug firmly fixed so that the explosive cannot escape. The ends of "**Cord, detonating**, flexible", must be fastened securely.
- For UN 0065 and 0289, inner packagings are not required when they are in coils.

Packing Instruction 140

Inner packagings

Bags
plastics
Reels
Sheets
paper, kraft
plastics
Receptacles
wood

Intermediate packagings

Not necessary

Outer packagings

Boxes
aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
other metal (4N)
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)
Drums
aluminium, removable head (1B1, 1B2)
fibre (1G)
other metal (1N1, 1N2)
plastics, removable head (1H1, 1H2)
plywood (1D)
steel, removable head (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- If the ends of UN 0105 are sealed, no inner packagings are required.
- For UN 0101, the packaging must be siftproof except when the fuse is covered by a paper tube and both ends of the tube are covered with removable caps.
- For UN 0101, steel or aluminium boxes or drums must not be used.

Packing Instruction 141

Inner packagings

Receptacles
fibreboard
metal
plastics
wood
Trays, fitted with dividing partitions
plastics
wood
Dividing partitions in the
outer packagings

Intermediate packagings

Not necessary

Outer packagings

Boxes
aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
other metal (4N)
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)
Drums
aluminium, removable head (1B1, 1B2)
fibre (1G)
other metal (1N1, 1N2)
plastics, removable head (1H1, 1H2)
plywood (1D)
steel, removable head (1A1, 1A2)

Packing Instruction 142

Inner packagings

Bags

paper
plastics

Receptacles

fibreboard
metal
plastics
wood

Sheets

paper

Trays, fitted with dividing partitions

plastics

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
~~other metal (4N)~~
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
~~other metal (1N1, 1N2)~~
plastics, ~~removable head~~ (1H1, 1H2)
plywood (1D)
steel, ~~removable head~~ (1A1, 1A2)

Packing Instruction 143

Inner packagings

Bags

paper, kraft
plastics
textile
textile, rubberized

Receptacles

fibreboard
metal
plastics
~~wood~~

Trays, fitted with dividing partitions

plastics
wood

Intermediate packagings

Not necessary

Outer packagings

Boxes

aluminium (4B)
fibreboard (4G)
natural wood, ordinary (4C1)
natural wood, with siftproof walls (4C2)
~~other metal (4N)~~
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
~~other metal (1N1, 1N2)~~
plastics, ~~removable head~~ (1H1, 1H2)
plywood (1D)
steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0271, 0272, 0415 and 0491, when metal packagings are used, metal packagings must be so constructed that the risk of explosion, by reason of increase in internal pressure from internal or external causes, is prevented.
- Instead of the above inner and outer packagings, composite packagings (6HH2) (plastic receptacle with outer solid box) may be used.

Chapter 4

CLASS 2 — GASES

Parts of this Chapter are affected by State Variations CA 17, US 6, US 15; see Table A-1

...

4.2 PACKING INSTRUCTIONS

Packing Instruction 200

...

- 4) Gas mixtures containing any of the following gases must not be offered for transport in aluminium alloy cylinders unless approved by the appropriate national authority of the State of Origin and the State of the Operator:

UN 1037 **Ethyl chloride**
 UN 1063 **Methyl chloride**
 UN 1063 **Refrigerant gas R 40**
 UN 1085 **Vinyl bromide, stabilized**
 UN 1086 **Vinyl chloride, stabilized**
 UN 1860 **Vinyl fluoride, stabilized**
 UN 1912 **Methyl chloride and methylene chloride mixture**

- 5) **Keys for the column** "Special packing provisions":

Material compatibility

- a) Aluminium alloy cylinders are forbidden.
- b) Copper valves are forbidden.
- c) Metal parts in contact with the contents must not contain more than 65 per cent copper.
- d) When steel cylinders are used, only those bearing the "H" mark **in accordance with 6.5.2.7.4 p)** are permitted.

...

...

Packing Instruction 202

...

- 6) Pressure-relief devices

Every closed cryogenic receptacle, having a nominal capacity in excess of 550 L, must be provided with at least 2 pressure-relief devices. The pressure-relief device must be of the type that will resist dynamic forces including surge.

Closed cryogenic receptacles, having a nominal capacity of 550 L or less, must be provided with at least 1 pressure-relief device, and may in addition have a frangible disc in parallel with the spring loaded device in order to meet the requirements of 6.5.1.3.6.5. The pressure-relief device must be of the type that will resist dynamic forces including surge.

Note.— The pressure-relief devices must meet the requirements of 6.5.1.3.6.4 and 6.5.1.3.6.5.

- 7) Compatibility

Materials used to ensure the leakproofness of the joints or for the maintenance of the closures must be compatible with the contents. In the case of receptacles intended for the transport of oxidizing gases (i.e. with a subsidiary risk of 5.1), these materials must not react with these gases in a dangerous manner.

8) Periodic inspection

The periodic inspection and test frequencies of pressure relief valves must not exceed five years.

See paragraph 2.2.2 of this report:

Note.— Insulated packagings containing refrigerated liquid nitrogen fully absorbed in a porous material are not subject to these Instructions when carried as cargo provided they meet the requirements of Special Provision A152.

Requirements for open cryogenic receptacles

Open cryogenic receptacles must be constructed to meet the following requirements:

...

9. Open cryogenic receptacles must bear the following marks permanently affixed, e.g. by stamping, engraving or etching:

- the manufacturer's name and address;
- the model number or name;
- the serial or batch number;
- the UN number and proper shipping name of gases for which the receptacle is intended;
- the capacity of the receptacle in litres.

Note.— ~~The marking on open cryogenic receptacles will become mandatory with effect from 1 January 2012 for open cryogenic receptacles manufactured after 1 January 2012.~~ The size of the marking must be as set out for cylinders in Part 6;5.2.7.1. Open cryogenic receptacles manufactured prior to 1 January 2012 are not required to be so marked.

10. Open cryogenic receptacles are permitted for nitrogen, argon, krypton, neon and xenon refrigerated liquids.

...

Packing Instruction Y203

This Instruction applies to UN 1950 and 2037.

The requirements of 3;4 must be met.

Single packagings are not permitted.

COMBINATION PACKAGINGS:

INNER:

See paragraph 2.5.2 of this report:

Metal aerosols 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 ~~N~~non-refillable metal aerosols and non-refillable receptacles containing gas (gas cartridges) must not exceed 1 000 mL capacity.

...

...

Packing Instruction 206

Passenger and cargo aircraft for UN 3167, UN 3168 and UN 3169 only

General requirements

Part 4, Chapter 1 requirements must be met, including:

A gas sample may only be accepted for transport as a non-pressurized gas providing it is at a pressure corresponding to ambient atmospheric pressure at the time the containment system is closed and this must not exceed 105 kPa absolute.

See paragraph 3.2.23.1 b) of DGP/23-WP/3 and Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.10/1/Rev.17/Corr.1:

Cylinders and gas receptacles conforming to the construction, testing and filling requirements approved by the appropriate national authority are permitted.

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.

...

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

See paragraph 3.2.12 of DGP/23-WP/3 and paragraph 2.5.1.3 of this report:

Packing Instruction 214

Cargo aircraft only for UN 3468 only

This Instruction applies to storage systems containing hydrogen absorbed in a metal hydride (UN 3468) individually or when contained in equipment and apparatus when transported on cargo aircraft.

- 1) For metal hydride storage systems, the general packing requirements of 4;4.1 must be met.
- 2) Only cylinders not exceeding 150 L in water capacity and having a maximum developed pressure not exceeding 25 MPa are covered by this packing instruction.
- 3) Metal hydride storage systems meeting the applicable requirements of 6;5 for the construction and testing of cylinders containing gas may be used for the transport of hydrogen only.

- 4) When steel cylinders or composite cylinders with steel liners are used, only those bearing the "H" mark, in accordance with 6;5.2.9 j) are permitted.
- 5) Metal hydride storage systems must meet the service conditions, design criteria, rated capacity, type tests, batch tests, routine tests, test pressure, rated charging pressure and provisions for pressure relief devices for transportable metal hydride storage systems specified in ISO 16111:2008, and their conformity and approval must be assessed in accordance with 6;5.2.5.
- 6) Metal hydride storage systems must be filled with hydrogen at a pressure not exceeding the rated charging pressure shown in the permanent markings on the system as specified in ISO 16111:2008.
- 7) The periodic test requirements for a metal hydride storage system must be in accordance with ISO 16111:2008 and carried out in accordance with 6;5.2.6, and the interval between periodic inspections must not exceed five years.
- 8) Storage systems with a water capacity of less than 1 L must be packaged in rigid outer packagings constructed of suitable material of adequate strength and design in relation to the packaging capacity and its intended use. They must be adequately secured or cushioned so as to prevent damage during normal conditions of transport.
- 9) Maximum net quantity per package for cargo aircraft is 100 kg of metal hydride storage systems, including when such storage systems are packed with equipment or contained in equipment.

See paragraph 2.5.1 of this report:

Packing Instruction 215

Passenger and cargo aircraft for UN 3478 and 3479 only

...

OUTER PACKAGINGS

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

Packing Instruction Y215

Limited quantities for UN 3478 and 3479 only

...

OUTER PACKAGINGS

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

See paragraph 2.5.4 of this report:

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 [PAS 62282-6-4 62282-6-100](#) Ed. 1 [\[and Amendment 1\]](#) or a standard approved by the appropriate authority of the State of Origin.

...

...

See paragraph 3.2.23.1 d) of DGP/23-WP/3 and paragraph 2.4.4 of this report:

Packing Instruction 218

Passenger and cargo aircraft for UN 3500, 3501, 3502, 3503, 3504 and 3505 only

General requirements

The general requirements of 4.1 applicable to cylinders must be met. Cylinders, constructed as specified in 6.5 are authorized for the transport of UN 3500, UN 3501, UN 3502, UN 3503, UN 3504 and UN 3505. Cylinders other than UN marked and certified cylinders may be used if the design, construction, testing, approval and markings conform to the requirements of the appropriate national authority of the State in which they are approved and filled. The substances contained must be permitted in cylinders and permitted for air transport according to these Instructions. Cylinders for which prescribed periodic tests have become due must not be charged and offered for transport until such retests have been successfully completed.

Compatibility requirements

- 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.
- The necessary steps must be taken to prevent dangerous reactions (i.e. polymerization or decomposition) during transport. If necessary, stabilization or addition of an inhibitor may be required.

Periodic inspection

- The maximum test period for periodic inspection of the cylinders must be 5 years.

ADDITIONAL PACKING REQUIREMENTS

- Cylinders must be so filled that at 50°C the non-gaseous phase does not exceed 95% of their water capacity and they are not completely filled at 60°C. When filled, the internal pressure at 65°C must not exceed the test pressure of the cylinders. The vapour pressures and volumetric expansion of all substances in the cylinders must be taken into account.
- Spray application equipment (such as a hose and wand assembly) must not be connected during transport.
- The minimum test pressure must be in accordance with Packing Instruction 200 for the propellant but must not be less than 20 bar.
- Non-refillable cylinders used may have a water capacity in litres not exceeding 1 000 litres divided by the test pressure expressed in bars provided capacity and pressure restrictions of the construction standard comply with ISO 11118:1999, which limits the maximum capacity to 50 litres.

OUTER PACKAGINGSBoxesDrumsJerricansStrong outer packagings

...

Chapter 5

CLASS 3 — FLAMMABLE LIQUIDS

~~Note. — Class 3 packing instructions have been replaced with the reformatted packing instructions which appeared in Attachment 4 of the 2009-2010 Edition. Further modifications to these packing instructions are indicated with the customary margin symbols.~~

...

5.1 PACKING INSTRUCTIONS

See paragraph 2.5.1 of this report:

Packing Instructions Y340 – Y344

Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)*Boxes**Drums**Jerricans*

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Aluminium
Plastics
Steel

Packing Instructions 350 – 355

Passenger aircraft

...

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS*Packing Group I*

See paragraph 3.2.25 of DGP/23-WP/3:

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

Packing Group III

- Packagings must meet the Packing Group II performance requirements if the substance has a Class 8 subsidiary risk.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instructions 360 – 366

Cargo aircraft only

...

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

See paragraph 3.2.25 of DGP/23-WP/3:

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

Packing Group III

- Packagings must meet the Packing Group II performance requirements if the substance has a Class 8 subsidiary risk.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plywood (1D)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Other metal (3N2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 370

Passenger and cargo aircraft for UN 3269 (Packing Group II or III) only

See paragraph 2.5.10 of this report:

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.

— Metal packagings must be corrosion resistant or be protected against corrosion for substances with a Class 8 subsidiary risk.

...

See paragraph 2.5.9 of this report:

COMBINATION PACKAGINGS						SINGLE PACKAGINGS
Packing conditions	Inner packaging (see 6;3.2)	<u>Inner packaging quantity (per receptacle) — for base liquid material</u>	Inner packaging quantity (per receptacle) — for liquid activator	Inner packaging quantity (per receptacle) — for solid activator	Total quantity per package	
Activator (Organic peroxide)	Plastics*	<u>n/a</u>	125 mL	500 g	5 kg	No
	Metal*	<u>n/a</u>	125 mL	500 g		
Base material Class 3 Packing Group II or III	Glass	<u>1.0 L</u>	<u>4.0 L n/a</u>	<u>4.0 L n/a</u>		
	Plastics	<u>5.0 L</u>	<u>5.0 L n/a</u>	<u>5.0 L n/a</u>		
	Metal	<u>5.0 L</u>	<u>5.0 L n/a</u>	<u>5.0 L n/a</u>		
<u>Activator (Organic peroxide)</u>	<u>Plastics*</u>	<u>n/a</u>	<u>125 mL</u>	<u>500 g</u>	<u>10 kg</u>	<u>No</u>
	<u>Metal*</u>	<u>n/a</u>	<u>125 mL</u>	<u>500 g</u>		
<u>Base material Class 3 Packing Group III</u>	<u>Glass</u>	<u>2.5 L</u>	<u>n/a</u>	<u>n/a</u>		
	<u>Plastics</u>	<u>10.0 L</u>	<u>n/a</u>	<u>n/a</u>		
	<u>Metal</u>	<u>10.0 L</u>	<u>n/a</u>	<u>n/a</u>		

*Including tubes

The total quantity of kits per package is to be calculated on a one-to-one basis of their volume, i.e. 1 L equal to 1 kg.

...

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction Y370

Limited quantities
Passenger and cargo aircraft for UN 3269 (Packing Group II or III) only

See paragraph 2.5.9 of this report:

...

COMBINATION PACKAGINGS							SINGLE PACKAGINGS	
Packing conditions	Inner packaging (see 6.3.2)	<u>Inner packaging quantity (per receptacle) — for base liquid material</u>	<u>Inner packaging quantity (per receptacle) — for liquid activator</u>	<u>Inner packaging quantity (per receptacle) — for solid activator</u>	Total quantity per package	<u>Total gross mass per package</u>		
Activator (Organic peroxide)	Plastics*	<u>n/a</u>	30 mL	100 g	1 kg	<u>30 kg</u>	No	
	Metal*	<u>n/a</u>	30 mL	100 g				
Base material Class 3 Packing Group II or III	Glass	<u>1.0 L</u>	<u>4.0 L n/a</u>	<u>4.0 L n/a</u>				
	Plastics	<u>1.0 L</u>	<u>4.0 L n/a</u>	<u>4.0 L n/a</u>				
	Metal	<u>1.0 L</u>	<u>4.0 L n/a</u>	<u>4.0 L n/a</u>				
<u>Activator (Organic peroxide)</u>	<u>Plastics*</u>	<u>n/a</u>	<u>30 mL</u>	<u>100 g</u>	<u>5 kg</u>			
	<u>Metal*</u>	<u>n/a</u>	<u>30 mL</u>	<u>100 g</u>				
<u>Base material Class 3 Packing Group III</u>	<u>Glass</u>	<u>2.5 L</u>	<u>n/a</u>	<u>n/a</u>				
	<u>Plastics</u>	<u>5.0 L</u>	<u>n/a</u>	<u>n/a</u>				
	<u>Metal</u>	<u>5.0 L</u>	<u>n/a</u>	<u>n/a</u>				

*Including tubes

The total quantity of kits per package is to be calculated on a one-to-one basis of their volume, i.e. 1 L equal to 1 kg.

...

See paragraph 2.5.1 of this report:

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instruction 371

Passenger and cargo aircraft for UN 1204 and UN 3064 only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 372

Cargo aircraft only for UN 3165 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.

ADDITIONAL PACKING REQUIREMENTS

UN 3165 **Aircraft hydraulic power unit fuel tank** (containing a mixture of anhydrous hydrazine and methyl hydrazine) (M86 fuel) and designed for installation as complete units in aircraft are acceptable, subject to either of the following conditions:

Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.10/1/Rev.17/Corr.1:

- a) the unit must consist of an aluminium pressure ~~vessel~~ receptacle made from tubing and having welded heads. Primary containment of the fuel within this ~~vessel~~ receptacle must consist of a welded aluminium bladder having a maximum internal volume of 46 L. The outer ~~vessel~~ receptacle must have a minimum design gauge pressure of 1 275 kPa and a minimum burst gauge pressure of 2 755 kPa. Each ~~vessel~~ receptacle must be leak-checked during manufacture and before shipment and must be found leakproof. The complete inner unit must be securely packed in non-combustible cushioning material, such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings. Maximum quantity of fuel per unit and package is 42 L; or
- b) the unit must consist of an aluminium pressure ~~vessel~~ receptacle. Primary containment of the fuel within this ~~vessel~~ receptacle must consist of a welded hermetically sealed fuel compartment with an elastomeric bladder having a maximum internal volume of 46 L. The pressure ~~vessel~~ receptacle must have a minimum design gauge pressure of 2 860 kPa and a minimum burst gauge pressure of 5 170 kPa. Each ~~vessel~~ receptacle must be leak-checked during manufacture and before shipment and must be found leakproof. The complete inner unit must be securely packed in non-combustible cushioning material, such as vermiculite, in a strong outer tightly closed metal packaging which will adequately protect all fittings. Maximum quantity of fuel per unit and package is 42 L.

Note.— This packing instruction is the same as UN packing instruction P301.

Packing Instruction 373

Passenger and cargo aircraft for UN 1228 (Packing Group II or III) only

...

See paragraph 3.2.25 of DGP/23-WP/3:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

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

See paragraph 2.5.1 of this report:

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction Y373

Limited quantities

Passenger and cargo aircraft for UN 1228 (Packing Group III) only

...

COMBINATION PACKAGINGS						SINGLE PACKAGINGS
UN number and proper shipping name	Packing group	Inner packaging (see 6.3.2)	Inner packaging quantity (per receptacle)	Total quantity per package	Total gross mass per package	
UN 1228 Mercaptans, liquid, flammable, toxic, n.o.s.*	III	Glass	0.5 L	1 L	30 kg	No
		Plastics	0.5 L			
		Metal	0.5 L			

See paragraph 2.5.11 of this report:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

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

See paragraph 2.5.1 of this report:

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
<u>Other metal</u>	Plastics	
Plastics	Steel	
Plywood		
Reconstituted wood		
Steel		

Packing Instruction 374

Passenger and cargo aircraft for UN 3473 only

...

OUTER PACKAGINGS

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Steel (3A2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Other metal (1N2)	Aluminium (3B2)
<u>Other metal (4N)</u>	Plastics (1H2)	
Plastics (4H1, 4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

Packing Instruction Y374

Limited quantities for UN 3473 only

...

OUTER PACKAGINGS

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
<u>Other metal</u>	Plastics	
Plastics	Plywood	
Plywood	Steel	
Reconstituted wood		
Steel		

See paragraph 2.5.4 of this report:

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 ~~PAS 62282-6-1~~ 62282-6-100 Ed. 1 and Amendment 1 or a standard approved by the appropriate authority of the State of Origin.

...

...

See paragraph 2.5.1.5 of this report:

Packing Instruction 377

~~Passenger and e~~Cargo aircraft only for Chlorosilanes

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.
- Metal packagings must be corrosion resistant or be protected against corrosion.

2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS						SINGLE PACKAGINGS	
UN number	Inner packaging (see 6;3.2)	Net quantity per inner packaging — passenger	Net quantity per inner packaging — cargo	Total quantity per package — passenger	Total quantity per package — cargo	Passenger	Cargo
UN 1162, UN 1196, UN 1250, UN 1298, UN 1305, UN 2985	Glass	1.0 L	1.0 L	1.0 L	5.0 L	No	5.0 L
	Plastics	Forbidden	Forbidden				
	Steel	1.0 L	5.0 L				

OUTER PACKAGINGS OF COMBINATION PACKAGINGS*Boxes*

Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Plastics (4H1, 4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Fibre (1G)
 Plastics (1H1, 1H2)
 Plywood (1D)
 Steel (1A1, 1A2)

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY*Composites*

Plastic receptacle in steel drum (6HA1)

Cylinders

Steel (as permitted by 4;2.7)

Drums

Steel (1A1)

Jerricans

Steel (3A1)

Chapter 6

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

~~Note. Class 4 packing instructions have been replaced with the reformatted packing instructions which appeared in Attachment 4 of the 2009-2010 Edition. Further modifications to these packing instructions are indicated with the customary margin symbols.~~

...

6.2 PACKING INSTRUCTIONS

See paragraph 2.5.1 of this report:

Packing Instructions Y440 – Y443

Limited quantities
 Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)*Boxes*

Aluminium
 Fibreboard
 Natural wood
Other metal
 Plastics
 Plywood
 Reconstituted wood
 Steel

Drums

Aluminium
 Fibre
 Plastics
 Plywood
 Other metal
 Steel

Jerricans

Aluminium
 Plastics
 Steel

Packing Instructions 445 – 446

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instructions 448 – 449

Cargo aircraft only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

Packing Group III

See paragraph 2.5.7 of this report:

- Packagings must meet the Packing Group II performance requirements.
- Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

See paragraph 2.5.1 of this report:

SINGLE PACKAGINGS

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C2)
Other metal (4N)
Plywood (4D)
Plastics (4H2)
Reconstituted wood (4F)
Steel (4A)

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1, 1B2)
Fibre (1G)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 451

Passenger and cargo aircraft — wetted explosives (Packing Group I)

...

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 (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Other metal (3N2)
Plastics (3H1, 3H2)
Steel (3A2)

Packing Instruction 452

Passenger aircraft for UN 2555, 2556 and 2557 only

...

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 (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H1, 1H2)
Plywood (1D)

Jerricans

Aluminium (3B2)
Other metal (3N2)
Plastics (3H1, 3H2)
Steel (3A2)

Packing Instruction 453

Cargo aircraft only for UN 2555, 2556 and 2557 only

...

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 (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H1, 1H2)
Plywood (1D)

Jerricans

Aluminium (3B2)
Other metal (3N2)
Plastics (3H1, 3H2)
Steel (3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

See paragraph 2.5.7 of this report:

- Packagings must be designed and constructed to prevent the loss of water or alcohol content or the content of the phlegmatizer.
- Packagings must be so constructed and closed so as to avoid an explosive over pressure or pressure build-up of more than 300 kPa (3 bar).
- Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

...

See paragraph 2.5.1 of this report:

Packing Instruction 454

Passenger and cargo aircraft for UN 1324 only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

* These packagings are permitted only for a maximum of 600 m of film.

Packing Instruction Y454

Limited quantities
Passenger and cargo aircraft for UN 1324 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)*Boxes*

Aluminium
Fibreboard*
Natural wood
Other metal
Plywood
Reconstituted wood
Solid plastic*
Steel

Drums

Aluminium
Fibre*
Other metal

Plastics*
Steel

Jerricans

Aluminium
Plastics*
Steel

Packing Instruction 455

Passenger and cargo aircraft for UN 1944 and 1945 only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction Y455

Limited quantities

Passenger and cargo aircraft for UN 1944 and 1945 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

...

Packing Instruction 457

Passenger and cargo aircraft for UN 3241 only

...

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)
Other metal (1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction Y457

Limited quantities
 Passenger and cargo aircraft for UN 3241 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)*Boxes*

Aluminium
 Fibreboard
 Natural wood
Other metal
 Plastics
 Plywood
 Reconstituted wood
 Steel

Drums

Aluminium
 Fibre
 Other metal
 Plastics
 Steel

Jerricans

Aluminium
 Plastics
 Steel

Packing Instruction 458

Passenger and cargo aircraft for UN 3270 only

...

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 (1B2)
 Fibre (1G)
 Other metal (1N2)
 Plastics (1H2)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

Packing Instruction Y458

Limited quantities
 Passenger and cargo aircraft for UN 3270 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)*Boxes*

Aluminium
 Fibreboard
 Natural wood
Other metal
 Plastics
 Plywood
 Reconstituted wood
 Steel

Drums

Aluminium
 Fibre
 Other metal
 Plastics
 Steel

Jerricans

Aluminium
 Plastics
 Steel

Packing Instruction 459

Passenger and cargo aircraft — self-reactive substances

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Fibreboard (4G)
Natural wood (4C1, 4C2)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)

Drums

Fibre (1G)
Plastics (1H1, 1H2)
Plywood (1D)

Jerricans

Plastics (3H1, 3H2)

See paragraph 2.5.1 of this report:

Packing Instruction 462 – 463

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction 464 – 465

Cargo aircraft only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction 466 – 469

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 470 – 471

Cargo aircraft only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

See paragraph 2.5.7 of this report:

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

Packing Group III

- Packagings must meet the Packing Group II performance requirements.
- Fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

See paragraph 2.5.1 of this report:

SINGLE PACKAGINGS

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1, 1B2)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 472

Passenger and cargo aircraft for UN 1362 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium (4B)
Steel (4A)

Drums

Aluminium (1B1, 1B2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Steel (3A1, 3A2)

Packing Instruction 473

Passenger and cargo aircraft — for UN 1378 and UN 2881 only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instructions Y474 – Y477

Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instructions 478 – 479

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instructions 480 – 482

Cargo aircraft only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instructions 483 – 486

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instructions 487 – 491

Cargo aircraft only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

See paragraph 2.5.7 of this report:

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

- Fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

...

SINGLE PACKAGINGS FOR PACKING GROUP I

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1)
Other metal (1N1)
Plastics (1H1)
Steel (1A1)

Jerricans

Aluminium (3B1)
Plastics (3H1)
Steel (3A1)

See paragraph 2.5.1 of this report:

SINGLE PACKAGINGS FOR PACKING GROUPS II AND III ONLY

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1, 1B2)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans


Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 492

Passenger and cargo aircraft for UN 3292 only

...

See paragraph 3.2.12 of DGP/23-WP/3 and editorial amendment to clearly indicate that the packing condition applies to Batteries and not to Cells:

COMBINATION PACKAGINGS				SINGLE PACKAGINGS
<i>UN number and proper shipping name</i>	<i>Packing conditions</i>	<i>Total quantity per package — passenger</i>	<i>Total quantity per package — cargo</i>	
UN 3292 Batteries, containing sodium	Batteries may be offered for transport and transported unpacked or in protective enclosures such as fully enclosed or wooden slatted crates that are not subject to the requirements of Part 6 of these Instructions.	Forbidden	No limit	No limit
UN 3292 Cells, containing sodium		25 kg 	No limit	No

...

See paragraph 2.5.1 of this report:

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 (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Steel (1A2)

Jerricans

Aluminium (**3B1**, 3B2)
Plastics (**3H1**, 3H2)
Steel (**3A1**, 3A2)

Packing Instruction 493

Passenger aircraft for UN 3399 only

...

See paragraph 3.2.25 of DGP/23-WP/3:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Glass containers must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.
- Packagings must meet the Packing Group II performance requirements.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction 494

Cargo aircraft only for UN 3399

...

See paragraph 3.2.25 of DGP/23-WP/3:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

- Inner packagings must have threaded enclosures and must be surrounded in inert cushioning and absorbent material in a quantity sufficient to absorb the entire contents and enclosed in a leakproof liner, plastic bag or other equally effective means of intermediate leakproof containment.

Packing Group II

- Glass inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and enclosed in a leakproof liner, plastic bag or other equally effective means of intermediate leakproof containment.

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 495

Passenger and cargo aircraft for UN 3476 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium(4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium(1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

Packing Instruction Y495

Limited quantities for UN 3476 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

See paragraph 2.5.4 of this report:

Packing Instruction 496

Passenger and cargo aircraft for UN 3476 (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 ~~PAS 62282-6-4~~ 62282-6-100 Ed. 1 [and Amendment 1] or a standard approved by the appropriate authority of the State of Origin.

...

...

Chapter 7

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

~~Note. — Class 5 packing instructions have been replaced with the reformatted packing instructions which appeared in Attachment 4 of the 2009-2010 Edition. Further modifications to these packing instructions are indicated with the customary margin symbols.~~

...

7.2 PACKING INSTRUCTIONS

See paragraph 2.5.1 of this report:

Packing Instructions Y540 – Y541

Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instructions Y543 – Y546

Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instructions 550 – 551

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Packing Instructions 553 – 555

Cargo aircraft only

...

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

See paragraph 3.2.25 of DGP/23-WP/3:

- UN 1873 only glass inner packagings are permitted.
- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

...

Packing Instructions 557 – 559

Passenger aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS FOR PACKING GROUP I

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

OUTER PACKAGINGS OF COMBINATION PACKAGINGS FOR PACKING GROUPS II AND III

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instructions 561 – 563

Cargo aircraft only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS FOR PACKING GROUP I

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

OUTER PACKAGINGS OF COMBINATION PACKAGINGS FOR PACKING GROUPS II AND III ONLY

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

See paragraph 2.5.7 of this report:

Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

Packing Group III

— Packagings must meet the Packing Group II performance requirements.

SINGLE PACKAGINGS FOR PACKING GROUP I*Drums*

Aluminium (1B1, 1B2)
Other metal (1N1, 1N2)
Steel (1A1, 1A2)

SINGLE PACKAGINGS FOR PACKING GROUPS II AND III

<i>Boxes</i>	<i>Composites</i>	<i>Cylinders</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B) Fibreboard (4G) Natural wood (4C2) <u>Other metal (4N)</u> Plastics (4H2) Plywood (4D) Reconstituted wood (4F) Steel (4A)	All (see 6;3.1.18)	See 4;2.7	Aluminium (1B1, 1B2) Fibre (1G) Other metal (1N1, 1N2) Plastics (1H1, 1H2) Plywood (1D) Steel (1A1, 1A2)	Aluminium (3B1, 3B2) Plastics (3H1, 3H2) Steel (3A1, 3A2)

...

See paragraph 2.5.1 of this report:

Packing Instruction 570

Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Fibreboard (4G) Natural wood (4C1, 4C2) <u>Other metal (4N)</u> Plastics (4H1, 4H2) Plywood (4D) Reconstituted wood (4F)	Fibre (1G) Plastics (<u>1H1</u> , 1H2) Plywood (1D)	Plastics (<u>3H1</u> , 3H2)

Chapter 8

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

~~Note. Class 6, Division 6.2 packing instructions have been replaced with the reformatted packing instructions which appeared in Attachment 4 of the 2009-2010 Edition. Further modifications to these packing instructions are indicated with the customary margin symbols. Class 6, Division 6.1 packing instructions have not been reformatted.~~

...

8.1 PACKING INSTRUCTIONS

...

See paragraph 2.5.1.6 of this report:

Packing Instruction 622

The general packing requirements of 4;1 except 1.1.20 must be met.

Consignments must be prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during transport.

Consignments must be packed in steel drums (1A2), aluminium drums (1B2), other metal drums (1N2), plywood drums (1D), fibre drums (1G), plastic drums (1H2), steel jerricans (3A2), aluminium jerricans (3B2), plastic jerricans (3H2), steel boxes (4A), aluminium boxes (4B), wooden boxes (4C1, 4C2), plywood boxes (4D), reconstituted wood boxes (4F) or fibreboard boxes (4G), plastic boxes (4H1, 4H2), other metal boxes (4N). Packagings must meet Packing Group II requirements.

The packaging tests may be those appropriate for solids when there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids.

In all other circumstances, the packaging tests must be those appropriate for liquids.

Packagings intended to contain sharp objects such as broken glass and needles must be resistant to puncture and retain liquids under the performance test conditions for the packaging.

See paragraph 2.5.1 of this report:

Packing Instructions Y640 – Y642

Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes	Drums	Jerricans
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
<u>Other metal</u>	Plastics	
Plastics	Steel	
Plywood		
Reconstituted wood		
Steel		

...

Packing Instructions Y644 – Y645

Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

...

Packing Instructions 651 – 655

Passenger aircraft

...

See paragraph 3.2.25 of DGP/23-WP/3:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instructions 657 – 663

Cargo aircraft only

...

See paragraph 3.2.25 of DGP/23-WP/3:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instructions 665 – 670

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

See paragraph 2.5.7 of this report:

Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

See paragraph 2.5.1 of this report:

SINGLE PACKAGINGS FOR PACKING GROUP III (PI 670)

<i>Bags</i>	<i>Boxes</i>	<i>Composites</i>	<i>Cylinders</i>	<i>Drums</i>	<i>Jerricans</i>
Paper (5M2)	Aluminium (4B)	All (see	See 4;2.7	Aluminium (1B1, 1B2)	Aluminium (3B1, 3B2)
Plastic film (5H4)	Fibreboard (4G)	6;3.1.18)		Fibre (1G)	Plastics (3H1, 3H2)
Textile (5L3)	Natural wood (4C2)			Other metal (1N1, 1N2)	Steel (3A1, 3A2)
Woven plastics (5H3)	<u>Other metal (4N)</u>			Plastics (1H1, 1H2)	
	Plastics (4H2)			Plywood (1D)	
	Plywood (4D)			Steel (1A1, 1A2)	
	Reconstituted wood (4F)				
	Steel (4A)				

Packing Instructions 672 – 677

Cargo aircraft only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (<u>1B1</u> , 1B2)	Aluminium (<u>3B1</u> , 3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (<u>3H1</u> , 3H2)
Natural wood (4C1, 4C2)	Other metal (<u>1N1</u> , 1N2)	Steel (<u>3A1</u> , 3A2)
<u>Other metal (4N)</u>	Plastics (<u>1H1</u> , 1H2)	
Plastics (4H1, 4H2)	Steel (<u>1A1</u> , 1A2)	
Plywood (4D)		
Reconstituted wood (4F)		
Steel (4A)		

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

See paragraph 2.5.7 of this report:

Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

See paragraph 2.5.1 of this report:

...

SINGLE PACKAGINGS FOR PACKING GROUPS II AND III ONLY

<i>Boxes</i>	<i>Composites</i>	<i>Cylinders</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B) Fibreboard (4G) Natural wood (4C2) <u>Other metal (4N)</u> Plastics (4H2) Plywood (4D) Reconstituted wood (4F) Plastics (4H2) Steel (4A)	All (see 6;3.1.18)	See 4;2.7	Aluminium (1B1, 1B2) Fibre (1G) Other metal (1N1, 1N2) Plastics (1H1, 1H2) Plywood (1D) Steel (1A1, 1A2)	Aluminium (3B1, 3B2) Plastics (3H1, 3H2) Steel (3A1, 3A2)

SINGLE PACKAGINGS FOR PACKING GROUP III (PI 677 only)

<i>Bags</i>	<i>Boxes</i>	<i>Composites</i>	<i>Cylinders</i>	<i>Drums</i>	<i>Jerricans</i>
Paper (5M2) Plastic film (5H4) Textile (5L3) Woven plastics (5H3)	Aluminium (4B) Fibreboard (4G) Natural wood (4C2) <u>Other metal (4N)</u> Plastics (4H2) Plywood (4D) Reconstituted wood (4F) Steel (4A)	All (see 6;3.1.18)	See 4;2.7	Aluminium (1B1, 1B2) Fibre (1G) Other metal (1N1, 1N2) Plastics (1H1, 1H2) Plywood (1D) Steel (1A1, 1A2)	Aluminium (3B1, 3B2) Plastics (3H1, 3H2) Steel (3A1, 3A2)

Packing Instruction 679

Cargo aircraft only for UN 1700, 2016 and 2017 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>
Aluminium (4B) Fibreboard (4G) Natural wood (4C1, 4C2) <u>Other metal (4N)</u> Plastics (4H2) Plywood (4D) Reconstituted wood (4F) Steel (4A)	Aluminium (<u>1B1</u> , 1B2) Fibre (1G) Other metal (<u>1N1</u> , 1N2) Plastics (<u>1H1</u> , 1H2) Plywood (1D) Steel (<u>1A1</u> , 1A2)

Packing Instruction 680

Passenger and cargo aircraft for UN 1888 only

...

See paragraph 3.2.25 of DGP/23-WP/3:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instruction Y680

Limited quantities
Passenger and cargo aircraft for UN 1888 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

See paragraph 2.5.1.5 of this report:

Packing Instruction 681

~~Passenger and e~~Cargo aircraft only for Chlorosilanes

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.
- Metal packagings must be corrosion resistant or be protected against corrosion.

2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS						SINGLE PACKAGINGS	
UN number	Inner packaging (see 6;3.2)	Net quantity per inner packaging — passenger	Net quantity per inner packaging — passenger cargo	Total quantity per package — passenger	Total quantity per package — passenger cargo	Passenger	Cargo
UN 3361, UN 3362	Glass	1.0 L	1.0 L	1.0 L	30.0 L	No	30.0 L
	Plastics	Forbidden	Forbidden				
	Steel	1.0 L	5.0 L				

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes

Fibreboard (4G)
Natural wood (4C1, 4C2)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Fibre (1G)
Plastics (~~1H1~~, 1H2)
Plywood (1D)
Steel (~~1A1~~, 1A2)

SINGLE PACKAGINGS ~~FOR CARGO AIRCRAFT ONLY~~

Composites

Plastic receptacle in steel drum (6HA1)

Cylinders

Steel (as permitted by 4;2.7)

Drums

Steel (1A1)

Jerricans

Steel (3A1)

...

Chapter 10

CLASS 8 — CORROSIVE SUBSTANCES

~~+ Note. Class 8 packing instructions have been replaced with the reformatted packing instructions which appeared in Attachment 4 of the 2009-2010 Edition. Further modifications to these packing instructions are indicated with the customary margin symbols.~~

10.1 PACKING INSTRUCTIONS

...

Packing Instructions Y840 – Y841

Limited quantities
Passenger and cargo aircraft

...

See paragraph 2.5.6 of this report:

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group II

~~— Glass inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a compatible and rigid intermediate packaging before packing in outer packagings.~~

Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.10/1/Rev.17/Corr.1:

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium	Aluminium	Aluminium
Fibreboard	Fibre	Plastics
Natural wood	Other metal	Steel
<u>Other metal</u>	Plastics	
Plastics	Steel	
Plywood		
Reconstituted wood		
Steel		

See paragraph 2.5.1 of this report:

Packing Instructions Y843 – Y845

Limited quantities
Passenger and cargo aircraft

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instructions 850 – 852

Passenger aircraft

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

See paragraph 3.2.25 of DGP/23-WP/3:

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

See paragraph 2.5.1 of this report and Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.10/1/Rev.17/Corr.1:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

See paragraph 2.5.1 of this report:

Packing Instructions 854 – 856

Cargo aircraft only

...

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

Packing Group I

See paragraph 3.2.25 of DGP/23-WP/3:

- Inner packagings must be packed with sufficient absorbent material to absorb the entire contents of the inner packagings and placed in a rigid leakproof receptacle before packing in outer packagings.

Packing Group III

- Packagings must meet the Packing Group II performance requirements.

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

...

Packing Instructions 858 – 860

Passenger aircraft

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instructions 862 – 864

Cargo aircraft only

...

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

— Fibre, wood and plywood single packagings must be fitted with a suitable liner.

SINGLE PACKAGINGS FOR PACKING GROUP I

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1, 1B2)
Fibre (1G)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

SINGLE PACKAGINGS FOR PACKING GROUPS II AND III ONLY

Boxes

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1, 1B2)
Fibre (1G)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction 866

Cargo aircraft only for UN 2028 only

...

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 (1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Steel (1A2)

Packing Instruction 867

Passenger and cargo aircraft for UN 2803 only

...

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 (1B2)~~
 Fibre (1G)
 Other metal (~~1N1~~, 1N2)
 Plastics (~~1H1~~, 1H2)
 Steel (~~1A1~~, 1A2)

...

Packing Instruction 868

Passenger and cargo aircraft for UN 2809 only

...

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 (1B2)~~
 Fibre (1G)
 Other metal (~~1N1~~, 1N2)
 Plastics (~~1H1~~, 1H2)
 Steel (~~1A1~~, 1A2)

...

See paragraph 2.4.15 of this report:

Packing Instruction 869Passenger and cargo aircraft for UN ~~2809~~ 3506 ~~contained in manufactured articles~~ 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.
- Metal packagings must be corrosion resistant or be protected against corrosion.

2) Closure requirements

- Closures must meet the requirements of 4;1.1.4.

COMBINATION PACKAGINGS					
UN number and proper shipping name	Packing conditions		Total Net quantity* per package — passenger	Total Net quantity* per package — cargo	SINGLE PACKAGINGS
UN 2809 3506 Mercury contained in manufactured articles	Manufactured articles or apparatuses of which metallic mercury is a component part, such as manometers, pumps, thermometers, and switches.	Must have sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury which will prevent the escape of mercury from the package irrespective of its position. — Note. — Mercury switches and relays are excepted from the requirement for a sealed inner liner or bag providing they are of the totally enclosed leakproof type in sealed metal or plastic units.	No limit	No limit	No
	Electron tubes, mercury vapour tubes (tubes with less than a total net quantity of 450 g of mercury).	Tubes must be packed in strong outer packagings with all seams and joints sealed with self-adhesive, pressure-sensitive tape which will prevent the escape of mercury from the package. — Note. — Tubes with more than 450 g of mercury must be packaged according to the above instructions for manufactured articles or apparatuses.			

	<p>Electron tubes which do not contain more than 5 g of mercury each and which are packed in the manufacturer's original packagings, may be accepted up to a total net quantity of 30 g of mercury per package;</p> <p>or</p> <p>Tubes which are completely jacketed in sealed leakproof metal cases may be accepted in the manufacturer's original packagings.</p>	<p>May be excepted if packed in the manufacturer's original packagings.</p>			
--	---	---	--	--	--

* For the purposes of Part 5:4.1.5.1 the "net quantity" shown on the dangerous goods transport document is the net mass of the manufactured articles in each package. ~~Thermometers, switches and relays, each containing a total quantity of not more than 15 g of mercury, are excepted from the requirements of these Instructions 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 conditions normally incident to transport.~~

ADDITIONAL PACKING REQUIREMENTS

— Manufactured articles or apparatuses of which metallic mercury is a component part, such as manometers, pumps, thermometers, and switches must be packed in sealed inner liners or bags of strong leakproof and puncture-resistant material impervious to mercury which will prevent the escape of mercury from the package irrespective of its position before being packed in outer packagings.

Note.— Mercury switches and relays are excepted from the requirement for a sealed inner liner or bag providing they are of the totally enclosed leakproof type in sealed metal or plastic units.

— Electron tubes, mercury vapour tubes (tubes with less than a total net quantity of 450 g of mercury) must be packed in strong outer packagings with all seams and joints sealed with self-adhesive, pressure-sensitive tape which will prevent the escape of mercury from the package.

Note.— Tubes with 450 g of mercury or more must be packaged according to the requirements for manufactured articles or apparatuses (above).

— Electron tubes which are packed in sealed leakproof metal cases may be shipped in the manufacturer's original packagings.

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Drums

Jerricans

Strong outer packagings

CONSIGNMENT PROCEDURES

~~For electron tubes, mercury vapour tubes and similar tubes, the shipper must indicate the quantity of mercury on the dangerous goods transport document.~~

See paragraph 3.2.12 and 3.2.29 of DGP/23-WP/3:

Packing Instruction 870				
Passenger and cargo aircraft for UN 2794 and 2795 only				
...				
COMBINATION PACKAGINGS				SINGLE PACKAGINGS
UN number and proper shipping name	Packing conditions	Total quantity per package — passenger	Total quantity per package — cargo	
UN 2794 Batteries, wet, filled with acid UN 2795 Batteries, wet, filled with alkali	<p>Batteries must be placed in an acid/alkali-proof liner of sufficient strength and adequately sealed to positively preclude leakage in the event of spillage. The batteries must be packed so that the fill openings and vents, if any, are upward; they must be incapable of short-circuiting and be securely cushioned in the packagings. <u>The upright position of the package must be indicated on it by "Package orientation" labels (Figure 5-26) as required by 5.3. The words "This side up" or "This end up" may also be displayed on the top of the package.</u></p> <p><i>Batteries installed in equipment</i></p> <p>If batteries are shipped as an integral component of assembled equipment, they must be securely installed and fastened in an upright position and protected against contact with other articles so as to prevent short circuits. Batteries must be removed and packed according to this packing instruction if the assembled equipment is likely to be carried in other than an upright position.</p>	30 kg ☹	No limit	Unpackaged batteries No
...				

See paragraph 3.2.12 of DGP/23-WP/3:

Packing Instruction 871				
Passenger and cargo aircraft for UN 3028 only				
...				
COMBINATION PACKAGINGS				SINGLE PACKAGINGS
UN number and proper shipping name	Packing conditions	Total quantity per package — passenger	Total quantity per package — cargo	
UN 3028 Batteries, dry, containing potassium hydroxide solid	The batteries must be securely cushioned in the packagings.	25 kg ☹	230 kg ☹	No
...				

See paragraph 2.5.1 of this report:

Packing Instruction 873

Passenger and cargo aircraft for UN 3477

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium(4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium(1B2)
Fibre (1G)
Other metal (1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

Packing Instruction Y873

Limited quantities for UN 3477 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Plywood
Steel

Jerricans

Aluminium
Plastics
Steel

See paragraph 2.5.4 of this report:

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 ~~PAS-62282-6-1~~ 62282-6-100 Ed. 1 [and Amendment 1] or a standard approved by the appropriate authority of the State of Origin.

...

...

See paragraph 2.5.1 of this report:

Packing Instruction 876

Cargo aircraft only for Chlorosilanes

...

ÖUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes

Fibreboard (4G)
Natural wood (4C1, 4C2)
Plastics (4H1, 4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Fibre (1G)
Plastics (1H1, 1H2)
Plywood (1D)
Steel (1A1, 1A2)

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites

Plastic receptacle in steel drum (6HA1)

Cylinders

Steel (as permitted by 4;2.7)

Drums

Steel (1A1)

Jerricans

Steel (3A1)

Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

~~Note. — Class 9 packing instructions have been replaced with the reformatted packing instructions which appeared in Attachment 4 of the 2009-2010 Edition. Further modifications to these packing instructions are indicated with the customary margin symbols.~~

...

See paragraph 2.2.2 of this report:

Packing Instruction 953

Passenger and cargo aircraft for UN 2807 only

<i>UN number and proper shipping name</i>	<i>Quantity — passenger</i>	<i>Quantity — cargo</i>
UN 2807 Magnetized material	No limit	No limit

Magnetized materials with field strengths causing a compass deflection of more than 2 degrees at a distance of 2.1 m but not more than 2 degrees at a distance of 4.6 m (equivalent to 0.418 A/m or 0.00525 Gauss measured at a distance of 4.6 m) are not subject to any other requirements in these Instructions when carried as cargo except for the following:

- the shipper must make prior arrangements with the operator identifying the magnetized material. The dangerous goods transport document requirements of Part 5;4 are not applicable provided alternative written or electronic documentation includes the words "magnetized material" in association with the description of the goods;
- the package must bear the magnetized material handling label;
- the operator must stow the packaged magnetized material in accordance with 7;2.10; and
- the incident reporting requirements of 7;4.4 must be met.

Magnetized material with a field strength sufficient to cause a compass deflection of more than 2 degrees at a distance of 4.6 m may only be transported with the prior approval of the appropriate authority of the State of Origin and the State of the Operator.

See paragraph 3.2.18 of DGP/23-WP/2:

Packing Instruction 954

Passenger and cargo aircraft for UN 1845 only

...

- c) the dangerous goods transport document requirements of 5.4 are not applicable provided alternative written documentation is provided describing the contents. The information on the document must be shown in the location provided for the description of the goods. 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) UN 1845;

2) **Carbon dioxide, solid** or **Dry ice**;

3) the number of packages and the net quantity of dry ice in each package; and

d) the net mass of the **Carbon dioxide, solid** or **Dry ice** must be marked on the outside of the package; and

e) the information must be included with the description of the goods.

...

Packing Instruction 955

Passenger and cargo aircraft for UN 2990 and UN 3072 only

...

ADDITIONAL PACKING REQUIREMENTS

...

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.

See paragraph 2.5.1.8 of this report:

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.

Packing Instruction 956

Passenger and cargo aircraft for UN 1841, UN 1931, UN 3432, UN 2969, UN 3077, UN 3152 and UN 3335 only

...

See paragraph 3.2.11 of DGP/23-WP/3:

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	Quantity — passenger	Quantity — cargo
...						
UN 3335 Aviation regulated solid, n.o.s.	Glass	10.0 kg				
	Fibre	50.0 kg				
	Metal	50.0 kg	100 kg 400 kg	200 kg 400 kg	100 kg 400 kg	200 kg 400 kg
	Paper bag	50.0 kg				
	Plastics	50.0 kg				
	Plastic bag	50.0 kg				
...						

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

ADDITIONAL PACKING REQUIREMENTS FOR SINGLE PACKAGINGS

See paragraph 2.5.7 of this report:

- Fibre, fibreboard, wood and plywood single packagings must be fitted with a suitable liner.

See paragraph 2.5.1 of this report:

SINGLE PACKAGINGS

<i>Bags</i>	<i>Boxes</i>	<i>Composites</i>	<i>Cylinders</i>	<i>Drums</i>	<i>Jerricans</i>
Paper (5M2) Plastic film (5H4) Textile (5L3) Woven plastics (5H3)	Aluminium (4B) Fibreboard (4G) Natural wood (4C2) <u>Other metal (4N)</u> Plastics (4H2) Plywood (4D) Reconstituted wood (4F) Steel (4A)	All (see 6;3.1.18)	See 4;2.7	Aluminium (1B1, 1B2) Fibre (1G) Other metal (1N1, 1N2) Plastics (1H1, 1H2) Plywood (1D) Steel (1A1, 1A2)	Aluminium (3B1, 3B2) Plastics (3H1, 3H2) Steel (3A1, 3A2)

...

Packing Instruction Y956

Limited quantities

Passenger and cargo aircraft for UN 3077 and UN 3335 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium Fibreboard Natural wood <u>Other metal</u> Plastics Plywood Reconstituted wood Steel	Aluminium Fibre Other metal Plastics Steel	Aluminium Plastics Steel

Packing Instruction 957

Passenger and cargo aircraft for UN 2211 and UN 3314 only

...

SINGLE PACKAGINGS

<i>Boxes</i>	<i>Drums</i>
Fibreboard (4G) <u>Other metal (4N)</u> Plywood (4D) Reconstituted wood (4F) Wooden (4C1, 4C2)	Aluminium (1A ^B 1, 1B2) Fibre (1G) Plywood (1D) Steel (1A1, 1A2)

Packing Instruction 958

Passenger and cargo aircraft for UN 2071 and UN 2590 only

...

SINGLE PACKAGINGS

<i>Bags</i>	<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Plastics (5H4) Textile(5L3)	Fibreboard (4G) Natural wood (4C2) <u>Other metal (4N)</u> Plastics (4H1, 4H2) Plywood (4D) Reconstituted wood (4F)	Aluminium (1B2) Fibre (1G) Plastics (1H2) Plywood (1D) Steel (1A2)	Plastics (3H2) Steel (3A2)
Woven plastics (5H3)			

Packing Instruction Y958Limited quantities
Passenger and cargo aircraft

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium Fibreboard Natural wood <u>Other metal</u> Plastics Plywood Reconstituted wood Steel	Aluminium Fibre Other metal Plastics Steel	Aluminium Plastics Steel

...

Packing Instruction 960

Passenger and cargo aircraft for UN 3316 only

...

See paragraph 3.2.15 of DGP/23-WP/3 and paragraph 2.5.1.7 of this report:

ADDITIONAL PACKING REQUIREMENTS

- Kits may contain dangerous goods which require segregation according to Table 7-1.
- Packagings must meet the performance standards of the most stringent packing group assigned to any individual substance contained in the kit. Where the kit contains only dangerous goods to which no packing group is assigned, packagings must meet Packing Group II performance standards.
- Kits must not be packed with other dangerous goods in the same outer packaging, with the exception of dry ice. If dry ice is used, the requirements in Packing Instruction 954 must be met.

...

See paragraph 2.5.1 of this report:

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)

Packing Instruction Y960

Limited quantities
 Passenger and cargo aircraft for UN 3316 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Fibreboard
 Natural wood
Other metal
 Plastics
 Plywood
 Reconstituted wood

Packing Instruction 961

Passenger and cargo aircraft for UN 3268 only

...

Corrigendum to UN Model Regulations (Seventeenth revised Edition)
ST/SG/AC.10/1/Rev.17/Corr.1::

ADDITIONAL PACKING REQUIREMENTS FOR COMBINATION PACKAGINGS

- Packagings must meet the Packing Group III performance requirements.
- The packagings must be designed and constructed to prevent movement of the articles and inadvertent operation during normal conditions of transport.
- Any pressure ~~vessel~~ receptacle must be in accordance with the requirements of the appropriate national authority for the substance(s) contained ~~in the pressure vessel(s) therein~~.

...

See paragraph 2.5.1 of this report:

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 (1B2)
Fibre (1G)
Other metal (~~4N~~ 1N2)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Other metal (3N2)
Plastics (3H2)
Steel (3A2)

...

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.

...

See paragraph 2.5.8 of this report:

- e) Inner packagings must be tightly packed in strong outer packagings and must be so packed, secured or cushioned so as to prevent any breakage, puncture or leakage of contents into the outer packaging(s) during normal conditions of transport. Absorbent material must be provided for glass or earthenware inner packaging(s) containing consumer commodities in Class ~~2~~~~or~~ 3 or liquids of Division 6.1, in sufficient quantity to absorb the liquid contents of the largest of such inner packagings contained in the outer packaging. Absorbent and cushioning material must not react dangerously with the contents of the inner packagings. Notwithstanding the above, absorbent material may not be required if the inner packagings are so protected that breakage of the inner packagings and leakage of their contents from the outer packaging will not occur during normal conditions of transport.

...

- m) Packages prepared in accordance with these provisions must be durably and legibly marked with the mark shown in Figure 3-1.

~~Note. — Packages prepared for transport before 31 December 2010 using Packing Instruction 910 in the 2009-2010 Edition of these Instructions may be presented for transport until 31 March 2011 without the mark shown in Figure 3-1.~~

Packing Instruction 964

Passenger and cargo aircraft for UN 1941, UN 1990, UN 2315, UN 3151, UN 3082 and UN 3334 only

...

See paragraph 3.2.11 of DGP/23-WP/3:

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 3334 Aviation regulated liquid, n.o.s.	Glass	10.0 L	No Limit 450 L	No Limit 450 L	No Limit 450 L	No Limit 450 L
	Plastics	30.0 L				
	Metal	40.0 L				

See paragraph 2.5.1 of this report:

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)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Other metal (3N2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

SINGLE PACKAGINGS

Composites

All (see 6;3.1.18)

Cylinders

See 4;2.7

Drums

Aluminium (1B1, 1B2)
Other metal (1N1, 1N2)
Plastics (1H1, 1H2)
Steel (1A1, 1A2)

Jerricans

Aluminium (3B1, 3B2)
Plastics (3H1, 3H2)
Steel (3A1, 3A2)

Packing Instruction Y964

Limited quantities

Passenger and cargo aircraft for UN 1941, UN 1990, UN 3082 and UN 3334 only

...

OUTER PACKAGINGS OF COMBINATION PACKAGINGS (see 6;3.1)

Boxes

Aluminium
Fibreboard
Natural wood
Other metal
Plastics
Plywood
Reconstituted wood
Steel

Drums

Aluminium
Fibre
Other metal
Plastics
Steel

Jerricans

Aluminium
Plastics
Steel

Packing Instruction 965

Passenger and cargo aircraft for UN 3480

This entry applies to lithium ion or lithium polymer batteries.

~~Lithium 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).

See paragraph 2.3.3 of this report:

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are ~~prohibited~~ ~~forbidden~~ from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

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 the paragraphs above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

Contents	Package quantity (Section I)	
	Passenger	Cargo
Lithium ion cells and batteries	5 kg-G	35 kg-G

See paragraph 2.5.1.9 of this report:

ADDITIONAL PACKING 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 in~~ 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.

See paragraph 2.5.1.1 of this report:

OUTER PACKAGINGS

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	<u>Other metal (1N1)</u>	Steel (3A2)
<u>Other metal (4N)</u>	Plastics (1H2)	
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), ~~L~~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.

See paragraph 5.1.13 of this report:

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.

Lithium ion cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium ion cells and batteries	10 kg G	10 kg G

ADDITIONAL PACKING 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium ion batteries”, ~~“not restricted”~~ and ~~“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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

<p><i>Contents</i> <u>UN Number and Name</u></p>	<p><i>Package quantity</i> <i>(Section I)</i></p>	
	<i>Passenger</i>	<i>Cargo</i>
<p>Quantity of lithium ion cells and batteries per package, excluding equipment <u>UN 3481 Lithium ion batteries packed with equipment</u></p>	<p>5 kg <u>of lithium ion cells or batteries</u></p>	<p>35 kg <u>of lithium ion cells or batteries</u></p>

ADDITIONAL PACKING 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.

OUTER PACKAGINGS

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	Plastics (1H2)	Steel (3A2)
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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).

Lithium ion cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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).

ADDITIONAL PACKING REQUIREMENTS

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.
- 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.
- The maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares.
- Lithium ion 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.
- 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium ion batteries”, “~~not restricted~~” and “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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.9 (except 1.1.9.1).

See paragraph 3.2.12 of DGP/23-WP/3:

<p><i>Contents</i> <u>UN number and name</u></p>	<p><i>Not quantity per piece of equipment—Package quantity (Section I)</i></p>	
	<i>Passenger</i>	<i>Cargo</i>
<u>UN 3481</u> Lithium ion batteries contained in equipment	5 kg <u>of lithium ion cells or batteries</u>	35 kg <u>of lithium ion cells or batteries</u>

ADDITIONAL PACKING 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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

 See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

 See paragraph 5.1.13 of this report:

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).

Lithium ion cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

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.

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).

ADDITIONAL PACKING 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 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words "lithium ion batteries", "~~not restricted~~" and "~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium metal or lithium alloy batteries in Class 9 (Section I) and lithium metal or lithium alloy batteries subject to specific requirements of these Instructions (Section II).

~~Lithium 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).

See paragraph 2.3.3 of this report:

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are ~~prohibited~~ forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

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 the paragraphs above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

Contents	Package quantity (Section I)	
	Passenger	Cargo
Lithium metal cells and batteries	2.5 kg 	35 kg 

See paragraph 2.5.1.9 of this report:

ADDITIONAL PACKING 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 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, and in 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.
 - Cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive, and placed inside an outer packaging.

See paragraph 2.5.1.1 of this report:

OUTER PACKAGINGS

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	<u>Other metal (1N1)</u>	Steel (3A2)
<u>Other metal (4N)</u>	Plastics (1H2)	
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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.

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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).

<i>Contents</i>	<i>Package quantity (Section II)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium metal cells and batteries	2.5 kg G	2.5 kg G

ADDITIONAL PACKING 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 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium metal batteries”, “~~not restricted~~” and “~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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;

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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

Contents <u>UN number and name</u>	Package quantity (Section I)	
	Passenger	Cargo
Quantity of lithium metal cells and batteries per overpack, excluding equipment <u>UN 3091 Lithium metal batteries packed with equipment</u>	5 kg <u>of lithium metal cells or batteries</u>	35 kg <u>of lithium metal cells or batteries</u>

ADDITIONAL PACKING 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.
- Each completed package containing lithium cells or batteries must be marked and labelled in accordance with the applicable requirements of 5;1, 5;2 and 5;3.
- 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.

OUTER PACKAGINGS*Boxes*

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Plastics (4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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).

Lithium metal cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

General requirements

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).

ADDITIONAL PACKING REQUIREMENTS

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.
- 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 maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares.
- 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.
- 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium metal batteries”, “~~not restricted~~” and “~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

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).

See paragraph 3.2.12 of DGP/23-WP/3:

Package contents UN number and name	Net quantity per piece of equipment- Package quantity (Section I)	
	Passenger	Cargo
Lithium metal batteries UN 3091 Lithium metal batteries contained in equipment	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

ADDITIONAL PACKING 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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packaging

 See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

 See paragraph 5.1.13 of this report:

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).

Lithium metal cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

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.

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).

ADDITIONAL PACKING 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words "lithium metal batteries", "~~not restricted~~" and "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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.15 of this report:

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 3.2.23.1 a) of DGP/23-WP/3:

Packing Instruction 971

Passenger and cargo aircraft for UN 3499 only (see also Special Provision A186)

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.

<u>UN number and proper shipping name</u>	<u>Quantity — passenger</u>	<u>Quantity — cargo</u>
UN 3499 Capacitor , electric double layer	No limit	No limit

ADDITIONAL PACKING REQUIREMENTS

- 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

...

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:

See paragraph 2.3.3 of this report:

- a) the articles or substances are not ~~prohibited~~-forbidden for transport by air (see Part 1, Chapter 2);

...

See paragraph 2.6.2 of this report:

- i) before a package or overpack is reused, all inappropriate dangerous goods labels and markings are removed or completely obliterated;
- j) 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) 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.— This requirement also applies to consolidated shipments offered to the operator.

1.2.2 Certificates issued by the competent authority

- 1.2.2.1 Certificates issued by the competent authority are required for the following:

...

Certificates and applications for these certificates must be in accordance with the requirements in 6;7.22.

...

See paragraph 2.6.1 of this report:

Chapter 2

PACKAGE MARKINGS

Parts of this Chapter are affected by State Variations CA 4, DQ 4, ES 1, HK 2, MY 6, PK 1, US 1, US 7, VC 5, VU 1; see Table A-1

...

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" must be at least 12 mm high, except for packagings of 30 litres or 30 kg capacity or less, when they must be at least 6 mm in height and 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.

...

2.4.10 Marking of overpacks

See paragraph 2.6.4 of this report:

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.

...

Chapter 3

LABELLING

...

3.5.2 Handling labels

...

3.5.2.2 Lithium battery handling label

See paragraph 2.2.2 of this report:

Packages containing lithium batteries that meet the requirements of Section II—packed according to of Packing Instructions 965 to 970 ~~that are not subject to other additional requirements of these Instructions~~ 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. Where the package contains both types of batteries, the label must show "Lithium metal and lithium ion batteries".

...

Chapter 4

DOCUMENTATION

Parts of this Chapter are affected by State Variations AE 1, BN 1, CA 4, CA 14, CA 15, CA 16, CA 20, ES 1, HK 2, JM 2, JM 3, MY 6, PK 3, US 1, US 7, US 12, VC 7, VU 1, ZA 3; see Table A-1

...

4.1.5 Information required in addition to the dangerous goods description

...

4.1.5.1 Quantity of dangerous goods, number and type of packagings

The number of packages, type of packaging (e.g. steel drum, fibreboard box, etc.) and net quantity of dangerous goods in each package (by volume or mass, as appropriate) must be indicated for each item of dangerous goods bearing a different proper shipping name, UN number or packing group. Abbreviations may be used to specify the unit of measurement for the quantity. For packages containing the same dangerous goods and quantity per package a multiple of the quantity may be used. For example:

UN 1263, Paint, 3, PG II, 5 fibreboard boxes x 5 L

Consignment comprising packages of different quantities of the same dangerous good must be clearly identified. For example:

UN 1263, Paint, 3, PG II, 5 fibreboard boxes x 5 L, 10 fibreboard boxes x 10 L

See paragraphs 3.2.36 and 3.2.12 of DGP/23-WP/3:

UN packaging codes may only be used to supplement the description of the kind of package (e.g. one fibreboard box (4G)). For limited quantities, where the letter "G" follows the quantity in column 11 or 13 of Table 3-1, the gross mass of each package must be indicated, rather than the net quantity, except when there are different dangerous goods packed together in the same outer packaging, which must be described as shown in paragraph e); and:

- a) for empty uncleaned packagings as described by 4.1.4.3 b) only the number and type of packagings need be shown;
- b) for chemical kits and first aid kits, the total net mass of dangerous goods. Where the kits contain solids and/or liquids, the net mass of liquids within the kits is to be calculated on a 1 to 1 basis of their volume, i.e. 1 litre equal to 1 kilogram;
- c) for dangerous goods in machinery or apparatus, the individual total quantities of dangerous goods in solid, liquid or gaseous state, contained in the article;
- d) for dangerous goods transported in salvage packagings, an estimate of the quantity of dangerous goods must be given;

e) for items where "No Limit" or a packing instruction number is shown in columns 10 to 13 of Table 3-1, the quantity must be for dangerous goods in limited quantities with a 30 kg G limit in Table 3-1, where different dangerous goods are packed together in the same outer packaging, the net quantity of each dangerous goods followed by the gross mass of the completed package;

- 1) for substances the net mass or volume (e.g. UN 2969, UN 3291);
- 2) for UN 3091 and UN 3481 when packed with equipment in accordance with Packing Instructions 969 and 966 respectively, the net quantity of battery(ies) per package; and
- 3) for other articles the gross mass, followed by the letter G (e.g. UN 2794, UN 2800, UN 2990, UN 3166).

- f) for explosive articles of Class 1, the net quantity indicated for each package must be supplemented with the net explosive mass (see Part 1; 3.1.1 for the definition of net explosive mass) contained in the package followed by the unit of measurement. The abbreviations "NEQ", "NEM" or "NEW" may be indicated in association with the value provided.

Note.— The number, type and capacity of each inner packaging within the outer packaging of a combination packaging is not required to be indicated.

...

See paragraph 2.6.1 of this report:

4.1.5.6 Firework classification reference

4.1.5.6.1 When fireworks of UN Nos. 0336 or 0337 are transported, the dangerous goods transport document must include a classification reference(s) issued by the appropriate national authority.

4.1.5.6.2 The classification reference(s) must consist of the appropriate national authority's State, indicated by the distinguishing sign for motor vehicles in international traffic, the appropriate national authority identification and a unique serial reference. Examples of such classification references are:

GB/HSE123456

D/BAM1234

USA EX20091234.

Renumber subsequent paragraphs accordingly:

...

4.1.5-78 Additional requirements

4.1.5-78.1 The dangerous goods transport document must also contain:

- a) the packing instruction applied and, when applicable, reference to Special Provision A1 or A2, except for radioactive material;

~~*Note.— Until 31 March 2011, the shipper may present for transport packages prepared for transport before 31 December 2010 using packing instructions in the 2009-2010 Edition of these Instructions. In that instance, the dangerous goods transport document must indicate the packing instruction number in effect from the 2009-2010 Edition of these Instructions.*~~

...

Part 6

PACKAGING NOMENCLATURE, MARKING, REQUIREMENTS AND TESTS

Chapter 1

APPLICABILITY, NOMENCLATURE AND CODES

...

1.3 INDEX OF PACKAGINGS

Table 6-2. Index of packagings other than inner packagings

See paragraph 2.7.1 of this report:				
<i>Kind</i>	<i>Code and, where applicable, category</i>		<i>Paragraph</i>	<i>Maximum capacity (L)</i> <i>Maximum net mass (kg)</i>
...				
Plastic boxes	4H1	expanded plastic boxes	3.1.12	60
	4H2	solid plastic boxes	3.1.12	400
Steel or aluminium <u>or other metal</u> boxes	4A	steel	3.1.13	400
	4B	aluminium	3.1.13	400
	<u>4N</u>	<u>metal, other than steel or aluminium</u>	<u>3.1.13</u>	<u>400</u>
Textile bags	5L1	without inner liner or coating	Not used in these Instructions	
	5L2	siftproof	3.1.14	50
	5L3	water-resistant	3.1.14	50
...				
See paragraph 3.2.39 of DGP/23-WP/3:				
Woven plastic bags	5H1		<u>3.1.15</u>	Specialized use only <u>50</u>
...				

Chapter 2

MARKING OF PACKAGINGS OTHER THAN INNER PACKAGINGS

...

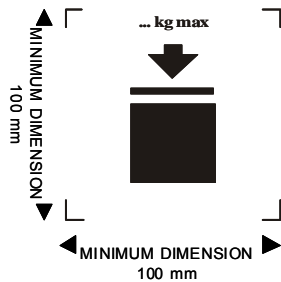
2.4 PACKAGING MARKINGS FOR INTERMEDIATE BULK CONTAINERS

...

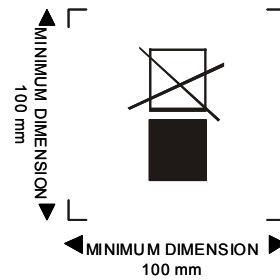
See paragraph 2.7.1 of this report:

2.4.3 The maximum permitted stacking load applicable when the IBC is in use must be displayed on a symbol as follows:

Replace the symbols in the 2011-2012 Edition with the following:



IBCs capable of being stacked



IBCs NOT capable of being stacked

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.

...

Chapter 3

REQUIREMENTS FOR PACKAGINGS

3.1 REQUIREMENTS FOR PACKAGINGS OTHER THAN INNER PACKAGINGS

General requirements

...

3.1.13 Steel ~~or~~ aluminium or other metal boxes

4A steel

4B aluminium

4N metal, other than steel or aluminium

...

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

...

5.1.1.5 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.

...

5.1.3 Service equipment

...

5.1.3.2 Service equipment must be configured or designed to prevent damage that could result in the release of the cylinder and closed cryogenic receptacle contents during normal conditions of handling and transport. The filling and discharge valves and any protective caps must be capable of being secured against unintended opening. Valves must be protected as specified in 4.1.1-~~9~~8.

...

5.1.6 Periodic inspection and testing

5.1.6.1 Refillable cylinders must be subjected to periodic inspections and tests by a body authorized by the appropriate national authority, in accordance with the following:

- a) check of the external conditions of the cylinder and verification of the equipment and the external markings;

...

- e) check of service equipment, other accessories and pressure-relief devices, if to be reintroduced into service.

Note.— For the periodic inspection and test frequencies, see Packing Instruction 200 or, for a chemical under pressure, Packing Instruction 218.

...

5.1.6.3 Pressure relief valves for closed cryogenic receptacles must be subject to periodic inspections and tests.

...

5.2.3 Service equipment

The following standards apply to closures and their protection:

~~ISO 11117:1998 — Gas cylinders — Valve protection caps and valve guards for industrial and medical gas cylinders — Design, construction and tests.~~

~~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.*~~

ISO 10297:2006 — Gas cylinders — Refillable gas cylinder valves — Specification and type testing.

~~ISO 13340:2001 — Transportable gas cylinders — Cylinder valves for non-refillable cylinders — Specification and prototype testing~~

For UN metal hydride storage systems, the requirements specified in the following standard apply to closures and their protection:

ISO 16111:2008 — Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride.

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:

...

ISO 11623:2002 — Transportable gas cylinders — Periodic inspection and testing of composite gas cylinders.

ISO 16111:2008 — Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride.

~~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.*~~

...

Part 7

OPERATOR'S RESPONSIBILITIES

Chapter 1

ACCEPTANCE PROCEDURES

...

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.

See paragraph 2.8.10 of this report:

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.— 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.

1.3 THE ACCEPTANCE CHECK

...

See paragraph 3.2.43 of DGP/23-WP/3:

- g) the outer of a combination packaging ~~of a package~~ or the single packaging is permitted by the applicable packing instruction, and when visible is of the type stated on the accompanying dangerous goods transport document;

...

Chapter 2

STORAGE AND LOADING

...

See paragraph 5.3.1 of this report:

2.1.3 For additional requirements concerning the loading of dangerous goods for carriage by helicopters, see Part 7:7.

See paragraph 2.8.6 of this report:

2.2 INCOMPATIBLE DANGEROUS GOODS

2.2.1 Segregation

Packages containing dangerous goods which might react dangerously one with another must not be stowed on an aircraft next to each other or in a position that would allow interaction between them in the event of leakage. As a minimum, the

segregation scheme shown in Table 7-1 must be followed in order to maintain acceptable segregation between packages containing dangerous goods having different hazards. The scheme applies irrespective of whether the hazard is the primary or subsidiary risk.

Table 7-1 below is moved from Part 7;1 (no change)

Table 7-1. Segregation between packages

<u>Hazard label</u>	<u>Class or division</u>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4.2</u>	<u>4.3</u>	<u>5.1</u>	<u>5.2</u>	<u>8</u>
<u>1</u>	<u>Note 1</u>	<u>Note 2</u>	<u>Note 2</u>	<u>Note 2</u>	<u>Note 2</u>	<u>Note 2</u>	<u>Note 2</u>	<u>Note 2</u>
<u>2</u>	<u>Note 2</u>	=	=	=	=	=	=	=
<u>3</u>	<u>Note 2</u>	=	=	=	=	x	=	=
<u>4.2</u>	<u>Note 2</u>	=	=	=	=	x	=	=
<u>4.3</u>	<u>Note 2</u>	=	=	=	=	=	=	x
<u>5.1</u>	<u>Note 2</u>	=	x	x	=	=	=	=
<u>5.2</u>	<u>Note 2</u>	=	=	=	=	=	=	=
<u>8</u>	<u>Note 2</u>	=	=	=	x	=	=	=

An "x" at the intersection of a row and column indicates that packages containing these classes of dangerous goods may not be stowed next to or in contact with each other, or in a position which would allow interaction in the event of leakage of the contents. Thus, a package containing Class 3 dangerous goods may not be stowed next to or in contact with a package containing Division 5.1 dangerous goods.

Note 1.— See 2.2.2.2 through 2.2.2.5.

Note 2.— This class or division must not be stowed together with explosives other than those in Division 1.4, Compatibility Group S.

Note 3. — Packages containing dangerous goods with multiple hazards in the class or divisions which require segregation in accordance with Table 7-1 need not be segregated from other packages bearing the same UN number.

...

2.4 LOADING AND SECURING OF DANGEROUS GOODS

See paragraph 5.3.1 of this report:

2.4.1 Loading ~~on~~ of cargo aircraft

...

2.4.1.1 Packages or overpacks of dangerous goods bearing the "Cargo aircraft only" label must be loaded ~~on~~ for carriage by a cargo aircraft in accordance with one of the following provisions:

- in a Class C aircraft cargo compartment; or
- in a unit load device equipped with a fire detection/suppression system equivalent to that required by the certification requirements of a Class C aircraft cargo compartment as determined by the appropriate national authority (a ULD that is determined by the appropriate national authority to meet the Class C aircraft cargo compartment standards must include "Class C compartment" on the ULD tag); or
- in such a manner that in the event of an emergency involving such packages or overpacks, a crew member or other authorized person can access those packages or overpacks, and can handle and, where size and mass permit, separate such packages or overpacks from other cargo; or

d) external carriage by a helicopter; or

e) with the approval of the State of the Operator, for helicopter operations, in the cabin (see Part S-7;2.4 of the Supplement).

Note.— Cargo compartment classification is described in the ICAO document Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481).

See paragraph 2.8.9 of this report:

2.4.1.2 The requirements of 2.4.1.1 do not apply to:

- a) ~~substances of flammable liquids~~ (Class 3), Packing Group III, other than those with a subsidiary risk of Class 8;
- b) ~~toxic and infectious~~ substances (~~Class Division 6.1~~) with no subsidiary risk other than Class 3;
- c) infectious substances (Division 6.2);
- ~~ed~~) radioactive material (Class 7);
- ~~ee~~) miscellaneous dangerous goods (Class 9).

Note — When transporting goods in a non-pressurized cargo hold, there will be a large pressure differential up to 75 kPa at cruise altitudes. Packages that are filled at a normal atmospheric pressure may not be capable of withstanding this pressure differential. Confirmation of the suitability of the packagings from the shipper should be obtained.

...

See paragraph 3.2.24 of DGP/23-WP/2 and paragraph 2.8.1.2 of this report:

2.6 VISIBILITY OF MARKINGS AND LABELS

During the course of air transport, including storage, markings and labels required by these Instructions must not be covered or obscured by any part of or attachment to the packaging or any other label or marking.

Renumber subsequent paragraphs accordingly

...

Editorial amendment:

2.910 SPECIAL PROVISIONS APPLICABLE TO THE CARRIAGE OF RADIOACTIVE MATERIAL

2.9.10.1 Limitation of exposure of persons to radiation

2.9.1.3 The practice should be followed of keeping exposure to radiation as low as reasonably achievable. The separation distances shown in Tables 7-~~23~~ and 7-~~34~~ are minimum values, and greater distances should be used where feasible. As far as possible, packages of radioactive materials stowed in underfloor cargo compartments of passenger aircraft should be placed on the compartment floor.

Note.— The separation distances from packages of radioactive material to passengers specified in Table 7-~~23~~ are based on a 0.02 mSv/h reference dose rate at a seat height of 0.4 m.

2.9.10.2 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-~~45~~.

2.9.10.3 Stowage during transport and storage in transit

...

2.9.10.3.3 Loading of freight containers and accumulation of packages, overpacks and freight containers must be controlled as follows:

- a) Except under the condition of exclusive use, the total number of packages, overpacks and freight containers aboard a single aircraft must be so limited that the total sum of the transport indexes aboard the aircraft does not exceed the values shown in Table 7-56. For consignments of LSA-I material, there is no limit on the sum of the transport indexes;
- b) Where a consignment is transported under exclusive use, there is no limit on the sum of the transport indexes aboard a single aircraft, but the requirement on minimum segregation distances established in 2.9.6 applies;
- c) The radiation level under routine conditions of transport must not exceed 2 mSv/h at any point on, and 0.1 mSv/h at 2 m from, the external surface of the aircraft;
- d) The total sum of the criticality safety indexes in a freight container and aboard an aircraft must not exceed the values shown in Table 7-67.

...

2.9.10.4 Segregation of packages containing fissile material during transport and storage in transit

2.9.10.4.2 Where the total sum of the criticality safety indexes on board an aircraft or in a freight container exceeds 50, as permitted in Table 7-67, 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.

...

2.9.10.6 Separation**2.9.10.6.1 Separation from persons**

Categories II — Yellow and III — Yellow packages, overpacks or freight containers must be separated from persons. The minimum separation distances to be applied are shown in Tables 7-23 and 7-34 and these distances are from the surface of the packages, overpacks or freight containers to the nearest inside surface of the passenger cabin or flight deck partitions or floors, irrespective of the duration of the carriage of the radioactive material. Table 7-34 applies only when radioactive material is being carried by a cargo aircraft, and in those circumstances the minimum distances must be applied as above and also to any other areas occupied by persons.

2.9.10.6.2 Separation from undeveloped photographic film

Categories II — Yellow and III — Yellow packages, overpacks or freight containers must be separated from undeveloped photographic films or plates. The minimum separation distances to be applied are shown in Table 7-78 and these distances are from the surface of the packages, overpacks or freight containers to the surface of the packages of undeveloped photographic films or plates.

See paragraph 3.2.23 of DGP/23-WP/2:

...

2.422.13 LOADING OF UN 2211-EXPANDABLE, POLYMERIC BEADS, EXPANDABLE OR UN 3314, PLASTICS MOULDING COMPOUND

A total of not more than 100 kg net mass of expandable polymeric beads (or granules), or plastic moulding materials, referenced to Packing Instruction 957, may be carried in any inaccessible hold on any aircraft.

2.4314 HANDLING OF SELF-REACTIVE SUBSTANCES AND ORGANIC PEROXIDES

During the course of transport, packages or unit load devices containing self-reactive substances of Division 4.1 or organic peroxides of Division 5.2 must be shaded from direct sunlight, stored away from all sources of heat in a well-ventilated area.

See paragraph 2.8.5 of this report:

2.15 HANDLING AND LOADING OF INTERMEDIATE BULK CONTAINERS (IBCs)

During handling and loading of intermediate bulk containers (IBCs), account must be taken of the IBC markings specified in 6.2.4.3, if present.

...

Chapter 4

PROVISION OF INFORMATION

4.1 INFORMATION TO THE PILOT-IN-COMMAND

See paragraph 3.5.11 of DGP/23-WP/2 and paragraph 5.5.1 of this report:

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, as early as practicable before departure of the aircraft, 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.

See paragraph 5.3.1 of this report:

For helicopter operations, with the approval of the State of the Operator, the notification to the pilot-in-command may be abbreviated or be by other means (e.g. radio communication, as part of the working flight documentation such as a journey log or operational flight plan) where circumstances make it impractical to produce written or printed information or on a dedicated form (see Part S-7.4.8 of the Supplement).

See paragraph 5.5.1 of this report:

Note 1.— This includes information about dangerous goods loaded at a previous departure point and which are to be carried on a subsequent flight.

Note 2.— Information required under 4.1.1 b) should be readily available to the operator's personnel whose responsibilities most closely align with the duties of the flight operations officer/flight dispatcher described in Annex 6, Part I, Chapter 4.6. These personnel are intended to provide the information required by Part 7.4.6 to facilitate emergency response.

Note 3.— The provision in 4.1.1 b) is recommended until 1 January 2014 when it will become mandatory.

See paragraph 3.2.41 of DGP/23-WP/3:

4.1.3 The information provided to the pilot-in-command must also include a signed confirmation, or some other indication, from the person responsible for loading the aircraft that there was no evidence of any damage to or leakage from the packages or any leakage from the unit load devices loaded on the aircraft.

...

See paragraph 5.5.1 of this report:

4.1.7 A legible copy of the information provided to the pilot-in-command must be retained on the ground. This copy must have an indication on it, or with it, that the pilot-in-command has received the information. ~~This~~ A copy, or the

information contained in ~~it the notice-to-the pilot-in-command~~, must be readily accessible to the ~~aerodromes of last departure and next scheduled arrival point, until after the flight to which the information refers~~ flight operations officer, flight dispatcher, or designated ground personnel responsible for flight operations until after the arrival of the flight.

...

See paragraph 3.5.9 of DGP/23-WP/2:

4.1.9 In the event that the volume of information provided to the pilot-in-command is such that in-flight radiotelephony transmission would be impracticable in an emergency situation, a summary of the information should also be provided by the operator, containing at least the quantities and class or division of the dangerous goods in each cargo compartment.

4.1.10 The dangerous goods listed in Table 7-9 need not appear on the information provided to the pilot-in-command.

Table 7-9
Dangerous goods not required to appear on the information to pilot-in-command

<u>UN Number</u>	<u>Item</u>	<u>Reference</u>
<u>n/a</u>	<u>Dangerous goods packed in excepted quantities</u>	<u>3;5.1.1</u>
<u>UN 2807</u>	<u>Magnetized material</u>	<u>Packing instruction 953</u>
<u>UN 2908</u>	<u>Radioactive material, excepted package — empty packaging</u>	<u>1;6.1.5.1 (a)</u>
<u>UN 2909</u>	<u>Radioactive material, excepted package — articles manufactured from natural uranium or depleted uranium or natural thorium</u>	<u>1;6.1.5.1 (a)</u>
<u>UN 2910</u>	<u>Radioactive material, excepted package — limited quantity of material</u>	<u>1;6.1.5.1 (a)</u>
<u>UN 2911</u>	<u>Radioactive material, excepted package — instruments or articles</u>	<u>1;6.1.5.1 (a)</u>
<u>UN 3090</u>	<u>Lithium metal batteries (including lithium alloy batteries) when meeting the requirements of Packing Instruction 968, Section II</u>	<u>Packing instruction 968, Section II</u>
<u>UN 3091</u>	<u>Lithium metal batteries contained in equipment (including lithium alloy batteries) when meeting the requirements of Packing Instruction 970, Section II</u>	<u>Packing instruction 970, Section II</u>
<u>UN 3091</u>	<u>Lithium metal batteries packed with equipment (including lithium alloy batteries) when meeting the requirements of Packing Instruction 969, Section II</u>	<u>Packing instruction 969, Section II</u>
<u>UN 3245</u>	<u>Genetically modified micro-organisms</u>	<u>Packing instruction 959</u>
<u>UN 3245</u>	<u>Genetically modified organisms</u>	<u>Packing instruction 959</u>
<u>UN 3373</u>	<u>Biological substance, Category B</u>	<u>Packing instruction 650, sub-paragraph 11</u>
<u>UN 3480</u>	<u>Lithium ion batteries (including lithium ion polymer batteries) when meeting the requirements of Packing Instruction 965, Section II</u>	<u>Packing instruction 965, Section II</u>
<u>UN 3481</u>	<u>Lithium ion batteries contained in equipment (including lithium ion polymer batteries) when meeting the requirements of Packing Instruction 967, Section II</u>	<u>Packing instruction 967, Section II</u>
<u>UN 3481</u>	<u>Lithium ion batteries packed with equipment (including lithium ion polymer batteries) when meeting the requirements of Packing Instruction 966, Section II</u>	<u>Packing instruction 966, Section II</u>

...

Chapter 4

DOCUMENTATION

...

See paragraph 2.2.2 of this report:

4.4 REPORTING OF DANGEROUS GOODS ACCIDENTS AND INCIDENTS

An operator must report dangerous goods accidents and incidents to the appropriate authorities of the State of the Operator and the State in which the accident or incident occurred in accordance with the reporting requirements of those appropriate authorities.

Note.— This includes incidents involving dangerous goods that are not subject to all or part of the ~~se-Technical~~ Instructions through the application of an exception or of a special provision (e.g. an incident involving the short circuiting of a dry cell battery that is required to meet short circuit prevention conditions in a special provision of 3;3).

See paragraph 3.2.26 of DGP/23-WP/2:

4.5 REPORTING OF UNDECLARED OR MISDECLARED DANGEROUS GOODS

An operator must report any occasion when undeclared or misdeclared dangerous goods are discovered in cargo or mail. Such a report must be made to the appropriate authorities of the State of the Operator and the State in which this occurred. An operator must also report any occasion when dangerous goods not permitted under 8;1.1.1 are discovered ~~in passengers' baggage either in the baggage or on the person of passengers or crew members~~. Such a report must be made to the appropriate authority of the State in which this occurred.

...

See paragraph 3.2.45 of DGP/23-WP/3 and paragraph 2.8.4 of this report:

4.6 REPORTING OF DANGEROUS GOODS OCCURRENCES

An operator must report any occasion when:

- a) dangerous goods are discovered to have been carried when not loaded, segregated, separated or secured in accordance with Part 7; 2; or
- b) dangerous goods are discovered to have been carried without information having been provided to the pilot-in-command in accordance with Part 7;4.1;

to the State of the Operator and the State of Origin.

Renumber subsequent paragraphs accordingly.

...

4.74.8 CARGO ACCEPTANCE AREAS — PROVISION OF INFORMATION

An operator or the operator's handling agent must ensure that notices giving information about the transport of dangerous goods are sufficient in number, prominently displayed and provided at a visible location(s) at the cargo acceptance points to alert shippers/agents about any dangerous goods that may be contained in their cargo consignment(s). These notices must include visual examples of dangerous goods, including batteries.

— Note.— Existing notices that do not include visual examples of dangerous goods, including batteries, may continue to be used until 31 December 2011 after which time the requirements specified above will apply.

See paragraph 5.3.1 of this report:

4.84.9 EMERGENCY RESPONSE INFORMATION

The operator must ensure that for consignments for which a dangerous goods transport document is required by these Instructions, appropriate information is immediately available at all times for use in emergency response to accidents and incidents involving dangerous goods in air transport. The information must be available to the pilot-in-command and can be provided by:

- a) the ICAO document *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481); or
- b) any other document which provides ~~similar~~ appropriate information concerning the dangerous goods on board.

Renumber paragraph 4.9 accordingly

See paragraph 3.2.42 of DGP/23-WP/3:

4.1011 RETENTION OF DOCUMENTS

4.10.1 The operator must ensure that at least one copy of the documents 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 which must be retained are the dangerous goods transport documents, the acceptance checklist (when this is in a form which requires physical completion) and the written information to the pilot-in-command.

4.10.2 For each package or overpack containing dangerous goods or freight container containing radioactive material or unit load device or other type of pallet containing dangerous goods as described in 1.4 that was not accepted by an operator due to an error or omission by the shipper in packaging, labelling, marking or documentation, a copy of the documentation as well as the acceptance checklist (when this is in a form which requires physical completion) should be retained for a minimum period of three months after the completion of the acceptance checklist.

Note.— Where the documents are kept electronically or in a computer system, they should be capable of being reproduced in a printed manner.

...

Chapter 5

PROVISIONS CONCERNING PASSENGERS AND CREW

5.1 INFORMATION TO PASSENGERS

...

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 should ensure that information on the types of dangerous goods which a passenger is forbidden to transport aboard an aircraft is provided to passengers. Information should be in pictorial form and should be such that the check-in process cannot be completed until the passenger has indicated that they have understood the restrictions on dangerous goods in baggage.

— Note.— The provisions in 5.1.1, 5.1.4 and 5.1.5 with respect to ticket purchase and check-in on operator websites will become mandatory in the 2013-2014 Edition of these Instructions.

...

See paragraph 2.8.3 of this report:

5.2 PASSENGER CHECK-IN PROCEDURES

5.2.1 Operators' check-in staff must be adequately trained to assist them in identifying and detecting dangerous goods carried by passengers other than as permitted in 8;1.1.2.

5.2.2 With the aim of preventing dangerous goods, which passengers are not permitted to have, from being taken aboard an aircraft in passengers' baggage or on their person, check-in staff should seek confirmation from a passenger that they are not carrying dangerous goods that are not permitted, and seek further confirmation about the contents of any item where there are suspicions that it may contain dangerous goods that are not permitted. Many innocuous-looking items may contain dangerous goods, and a list of general descriptions which, experience has shown, often apply to such items is shown in 7;6.

5.2.3 With the aim of preventing dangerous goods which a passenger is not permitted to have from being taken aboard an aircraft in excess baggage consigned as cargo, any organization or enterprise accepting excess baggage consigned as cargo should seek confirmation from the passenger, or a person acting on behalf of the passenger, that the excess baggage does not contain dangerous goods that are not permitted and seek further confirmation about the contents of any item where there are suspicions that it may contain dangerous goods that are not permitted.

...

See paragraph 5.3.1 of this report:

Chapter 7

HELICOPTER OPERATIONS

Note.— The requirements in this chapter are in addition to the other provisions of the Technical Instructions that apply to all operators (e.g. Part 7 and Part 1;4).

7.1.1 Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, there may be circumstances when the full provisions of the Technical Instructions are not appropriate or necessary, due to the operations involving un-manned sites, remote locations, mountainous areas or construction sites etc. In such circumstances and when appropriate, the State of the Operator may grant an approval in order to permit the carriage of dangerous goods without all of the normal requirements of the Technical Instructions being fulfilled. When States other than the State of the Operator have notified ICAO that they require prior approval of such operations, approval must also be obtained from the States of Origin and destination, as appropriate.

7.1.2 When loading dangerous goods for open external carriage by a helicopter, consideration should also be given to the type of packaging used and to the protection of those packagings, where necessary, from the effects of airflow and weather (e.g. by damage from rain or snow), in addition to the general loading provisions of 7;2.

7.1.3 When dangerous goods are carried suspended from a helicopter, the operator must ensure that consideration is given to the dangers of static discharge upon landing or release of the load.

7.1.4 When helicopters are carrying passengers, in accordance with Part S-7;2.2.4 of the Supplement, the State of the Operator may grant an approval to permit the carriage of dangerous goods either:

- a) in the cabin, when those dangerous goods are associated with and accompanied by the passengers; or
- b) in cargo compartments that do not meet the requirements of Part 7;2.1.1.

Part 8

PROVISIONS CONCERNING PASSENGERS AND CREW

...

1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

See paragraph 2.3.3 of this report:

1.1.1 Except as otherwise provided in 1.1.2, dangerous goods, including excepted packages of radioactive material, must not be carried by passengers or crew members, either as or in carry-on baggage or checked baggage or on their person. Except as provided for in 1.1.2 y) below, security type equipment such as attaché cases, cash boxes, cash bags, etc., incorporating dangerous goods, for example lithium batteries or pyrotechnic material, are totally forbidden; see entry in Table 3-1. Personal medical oxygen devices that utilize liquid oxygen are ~~prohibited~~ **forbidden** either as or in carry-on baggage or checked baggage or on the person. Electroshock weapons (e.g. Tasers) containing dangerous goods such as explosives, compressed gases, lithium batteries, etc. are ~~prohibited~~ **forbidden** in carry-on baggage or checked baggage or on the person.

...

See paragraph 2.9.1 of this report and Secretariat editorial changes to turn the letter listing which appears in the 2011-2012 Edition into a number list (to allow for more than the 26 letters of the alphabet):

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						
a1) Small gaseous oxygen or air cylinders required for medical use	Yes	Yes	Yes	Yes	Yes	4a) no more than 5 kg gross mass per cylinder; 2b) cylinders, valves and regulators, where fitted, must be protected from damage, which could cause inadvertent release of the contents; and 3c) the pilot-in-command must be informed of the number of oxygen or air cylinders loaded on board the aircraft and their loading location(s).
Devices containing liquid oxygen	No	No	No	n/a	n/a	Devices containing liquid oxygen are forbidden in carry-on baggage, checked baggage or on the person.
b2) Cylinders of a gas of Division 2.2 worn for the operation of mechanical limbs	Yes	Yes	Yes	No	No	Spare cylinders of a similar size are also allowed if required to ensure an adequate supply for the duration of the journey.

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			
e3) Non-radioactive medicinal articles (including aerosols)	Yes	Yes	Yes	No	No	4a) no more than 0.5 kg or 0.5 L total net quantity per single article; 2b) release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents; and 3c) no more than 2 kg or 2 L total net quantity of all articles mentioned in e3), j10) and m13) (e.g. four aerosol cans of 500 mL each) per person.
e4) Radioisotopic cardiac pacemakers or other devices, including those powered by lithium batteries implanted into a person	n/a	n/a	Yes	No	No	Must be implanted into a person 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.

See paragraphs 2.9.4, 5.1.8 and 5.1.9 of this report:

e5) Battery-powered wheelchairs or other similar mobility aids with non-spillable <u>wet</u> batteries <u>or with batteries which comply with Special Provision A123</u>	Yes	No	No	Yes	(<u>see 5 e) iv</u>)	4a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg); 2b) <u>non-spillable batteries</u> must comply with Special Provision A67 or the vibration and pressure differential tests of Packing Instruction 872; 3c) <u>the operator must verify that:</u> Reorder paragraphs i), ii) and iii) as indicated: <u>ii)</u> the battery terminals <u>must be are</u> protected from short circuits (e.g. by being enclosed within a battery container); <u>4i)</u> the battery <u>must be is</u> securely attached to the wheelchair or mobility aid; <u>5iii)</u> <u>electrical circuits have been isolated, the operator(s) must ensure that:</u> <u>wheelchairs or other battery-powered mobility aids are carried in such a manner so as to prevent unintentional activation; and</u> <u>they are protected from being damaged by the movement of</u>
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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			
						<p>baggage, mail, stores or other cargo;</p> <p>d) devices must be carried in a manner such that they are protected from being damaged by the movement of baggage, mail, stores or other cargo;</p> <p>e) where a battery-powered wheelchair or other similar mobility aid is specifically designed to allow its battery(ies) to be removed by the user (e.g. collapsible):</p> <p>i) the battery(ies) must be removed. The wheelchair or mobility aid may then be carried as checked baggage without restriction;</p> <p>ii) the removed battery(ies) must be carried in strong, rigid packagings which must be stowed in the cargo compartment;</p> <p>iii) the battery(ies) must be protected from short circuit;</p> <p>iv) the pilot-in-command must be informed of the location of the packed battery; and</p> <p>f) it is recommended that passengers make advance arrangements with each operator.</p>

See paragraphs 2.9.4, 5.1.8 and 5.1.9 of this report:

f6) Battery-powered wheelchairs or other similar mobility aids with spillable batteries	Yes	No	No	Yes	Yes	<p>4a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg);</p> <p>2b) the wheelchair or mobility aid can be loaded, stowed, secured and unloaded always in an upright position and the;</p> <p>c) the operator must verify that:</p> <p>Reorder paragraphs i), ii) and iii) as indicated:</p> <p>ii) battery terminals are protected from short circuits (e.g. by being enclosed within a battery container); and</p> <p>i) and the battery is securely attached to the wheelchair or mobility aid;</p> <p>iii) electrical circuits have been isolated;</p> <p>3d) the operator(s) devices must ensure that wheelchairs or other battery powered mobility aids are be</p>
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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			
						<p>carried in such a manner so as to prevent unintentional activation and <u>such</u> that they are protected from being damaged by the movement of baggage, mail, stores or other cargo;</p> <p><u>4e)</u> if the wheelchair or mobility aid cannot be loaded, stowed, secured and unloaded always in an upright position, the battery(ies) must be removed and <u>;</u> The wheelchair or mobility aid may then be carried as checked baggage without restriction;</p> <p><u>5f)</u> the removed battery must be carried in strong, rigid packagings as follows:</p> <ul style="list-style-type: none"> — the packagings must be leaktight, impervious to battery fluid and be protected against upset by securing them to pallets or by securing them in cargo compartments using appropriate means of securement (other than by bracing with freight or baggage) such as by use of restraining straps, brackets or holders; — batteries must be protected against short circuits, secured upright in these packagings and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; <p>See paragraph 3.2.29 of DGP/23-WP/2:</p> <ul style="list-style-type: none"> — these packagings must be marked “Battery, wet, with wheelchair” or “Battery, wet, with mobility aid” and be labelled with a “Corrosive” label (Figure 5-22) and with a package orientation label<u>s</u> (Figure 5-26) <u>as required by 5.3.3;</u> <p><u>6g)</u> <u>the pilot-in-command must be informed of the location of the wheelchair or mobility aid with an installed battery or the location of a packed battery.</u></p> <p><u>h)</u> it is recommended that passengers make advance arrangements with each operator; also unless batteries are nonspillable they should be fitted, where feasible, with spill-resistant vent caps.</p>

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			
See paragraph 3.2.51 of DGP/23-WP/3 and paragraphs 2.9.4, 5.1.8 and 5.1.9 of this report:						
g7) Lithium-ion battery-powered wheelchairs or other similar mobility aids	Yes	No* <u>(see 7 e)</u>	No	Yes	Yes	<p><u>4a)</u> for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg);</p> <p><u>2b)</u> the batteries must be of a type which meets the requirements of each test in the UN <i>Manual of Tests and Criteria</i>, Part III, <u>sub</u>-section 38.3;</p> <p><u>3c)</u> <u>the operator must verify that:</u></p> <p>Reorder paragraphs i), ii) and iii) as indicated:</p> <p><u>ii)</u> <u>the battery terminals must be are</u> protected from short circuits (e.g. by being enclosed within a battery container); <u>and</u></p> <p><u>i)</u> <u>the battery is</u> securely attached to the <u>wheelchair or</u> mobility aid; <u>and</u></p> <p><u>iii)</u> <u>electrical circuits have been isolated;</u></p> <p><u>4d)</u> <u>the operator(s) devices must ensure that such mobility aids are be</u> carried in a manner <u>so as to prevent unintentional activation and such</u> that they are protected from being damaged by the movement of baggage, mail, stores or other cargo; <u>and</u></p> <p><u>e)</u> <u>where a battery-powered wheelchair or other similar mobility aid is specifically designed to allow its battery(ies) to be removed by the user (e.g. collapsible):</u></p> <p><u>i)</u> <u>the battery(ies) must be removed and carried in the passenger cabin;</u></p> <p><u>ii)</u> <u>the battery terminals must be protected from short circuit (by insulating the terminals e.g. by taping over exposed terminals);</u></p> <p><u>iii)</u> <u>the battery must be protected from damage (e.g. by placing each battery in a protective pouch);</u></p> <p><u>iv)</u> <u>removal of the battery from the device must be performed by following the instructions of the manufacturer or device owner;</u></p> <p><u>v)</u> <u>the battery must not exceed 300 Wh;</u></p>

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			
						<p><u>vi) a maximum of one spare battery not exceeding 300 Wh or two spares not exceeding 160 Wh each may be carried; and</u></p> <p><u>e) the pilot-in-command must be informed of the location of the lithium ion battery(ies).</u></p> <p><u>5f) it is recommended that passengers make advance arrangements with each operator.</u></p>
<u>h8)</u> Portable medical electronic devices (Automated External Defibrillators (AED), Nebulizer, Continuous Positive Airway Pressure (CPAP), etc.) containing lithium metal or lithium ion cells or batteries	No	Yes	Yes	Yes	No	<p><u>4a)</u> carried by passengers for medical use;</p> <p><u>2b)</u> no more than two spare batteries may be carried. 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</p> <p><u>3c)</u> each installed or spare battery:</p> <ul style="list-style-type: none"> — must be of a type which meets the requirements of each test in the UN <i>Manual of Tests and Criteria</i>, Part III, <u>sub</u>-section 38.3; and — must not exceed the following: <ul style="list-style-type: none"> — 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.
<u>i9)</u> Small medical or clinical thermometer which contains mercury	Yes	Yes	Yes	No	No	<p><u>4a)</u> no more than one per person;</p> <p><u>2b)</u> must be for personal use; and</p> <p><u>3c)</u> must be in its protective case.</p>

Appendix to the Report on Agenda Item 2

2A-141

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			
Articles used in dressing or grooming						
j 10) Toiletry articles (including aerosols)	Yes	Yes	Yes	No	No	4 a) the term “toiletry articles (including aerosols)” is intended to include such items as hair sprays, perfumes and colognes; 2 b) no more than 0.5 kg or 0.5 L total net quantity per single article; 3 c) release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents; and 4 d) no more than 2 kg or 2 L total net quantity of all articles mentioned in e 3), j 10) and m 13) (e.g. four aerosol cans of 500 mL each) per person.
k 11) Hair curlers containing hydrocarbon gas	Yes	Yes	Yes	No	No	4 a) no more than one per person; 2 b) the safety cover must be securely fitted over the heating element; and 3 c) gas refills for such curlers must not be carried.
Consumer articles						
l 12) Alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume	Yes	Yes	Yes	No	No	4 a) must be in retail packagings; 2 b) no more than 5 L per individual receptacle; and 3 c) no more than 5 L total net quantity per person for such beverages. <i>Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to any restrictions.</i>
m 13) Aerosols in Division 2.2, with no subsidiary risk, for sporting or home use	Yes	No	No	No	No	4 a) no more than 0.5 kg or 0.5 L total net quantity per single article; 2 b) release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents; and 3 c) no more than 2 kg or 2 L total net quantity of all articles mentioned in e 3), j 10) and m 13) (e.g. four aerosol cans of 500 mL each) per person.
n 14) Securely packaged cartridges in Division 1.4S (UN 0012 or UN 0014 only);	Yes	No	No	Yes	No	4 a) no more than 5 kg gross mass per person for that person’s own use; 2 b) must not include ammunition with explosive or incendiary projectiles; and 3 c) allowances for more than one person must not be combined into one or more packages.

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			
e15) Small packet of safety matches	No	No	Yes	No	No	4a) no more than one per person; and 2b) intended for use by an individual.
"Strike anywhere" matches	No	No	No	n/a	n/a	Forbidden
Small cigarette lighter	No	No	Yes	No	No	4a) no more than one per person; 2b) intended for use by an individual; and 3c) does not contain unabsorbed liquid fuel (other than liquefied gas).
Lighter fuel and lighter refills	No	No	No	n/a	n/a	Forbidden

See paragraph 2.9.6 of this report:

<u>Premixing burner lighters (see the Glossary of Terms in Attachment 2) which contain liquefied gas, such as butane</u>	<u>No</u>	<u>No</u>	<u>Yes</u>	<u>n/a</u>	<u>n/a</u>	<u>Must have a means of protection against unintentional activation such as a child resistant lock or a mechanism of activation with two or more actions.</u>
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See paragraph 2.9.3 of this report:

p16) Battery-powered equipment capable of generating extreme heat, which could cause a fire if activated (e.g. underwater high intensity lamps)	Yes	Yes	No	Yes	No	4a) the heat producing component or and the battery is packed separately so as to prevent activation during transport <u>are isolated from each other by the removal of the heat producing component, the battery or another component (e.g. fuse); and</u> 2b) any battery which has been removed must be protected against short circuit <u>(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).</u>
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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			

See paragraph 2.9.5 of this report:

q17) Avalanche rescue backpack <u>containing a cylinder of compressed gas of Division 2.2</u>	Yes	Yes	No	Yes	No	4a) no more than one per person; 2b) <u>may contain a</u> pyrotechnic trigger mechanism <u>which</u> must not contain more than 200 mg net of Division 1.4S; 3) <u>the cylinder of compressed gas of Division 2.2 must not exceed 250 mL;</u> 4c) the backpack must be packed in such a manner that it cannot be accidentally activated; and 5d) the airbags within the backpack must be fitted with pressure relief valves.
f18) Small cartridges fitted into a self-inflating life-jacket	Yes	Yes	Yes	Yes	No	4a) limited to carbon dioxide or another suitable gas in Division 2.2; 2b) must be for inflation purposes; 3c) no more than two small cylinders of carbon dioxide or another suitable gas in Division 2.2 fitted in the life-jacket, per person; and 4d) no more than two spare cartridges.

See paragraph 3.2.48 of DGP/23-WP/3:

<u>Small cartridges fitted into other devices</u>	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>a) no more than four small cylinders of carbon dioxide or other suitable gas in Division 2.2, per person; and</u> <u>b) the water capacity of each cylinder must not exceed 50 mL.</u> <u>Note.— For carbon dioxide, a gas cylinder with a water capacity of 50 mL is equivalent to a 28 g cartridge.</u>
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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			

~~s19~~ Portable electronic devices (such as watches, calculating machines, cameras, cellular phones, laptop computers,) camcorders, ~~etc.~~)

See paragraph 5.1.3 of this report:

Portable electronic devices containing lithium <u>metal</u> or lithium ion cells or batteries	Yes	Yes	Yes	No	No	<p>4a) carried by passengers or crew for personal use;</p> <p>2b) should be carried as carry-on baggage; and</p> <p>3c) each battery must not exceed the following:</p> <ul style="list-style-type: none"> — 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_i; <p>See paragraph 5.1.3 of this report:</p> <p><u>d) if devices are carried in checked baggage, measures must be taken to prevent unintentional activation; and</u></p> <p>See paragraph 3.2.53 of DGP/23-WP/3:</p> <p><u>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, sub-section 38.3.</u></p>
Spare batteries for portable electronic devices containing lithium <u>metal</u> or lithium ion cells or batteries	No	Yes	Yes	No	No	<p>4a) carried by passengers or crew for personal use;</p> <p>2b) 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);</p> <p>3c) each battery must not exceed the following:</p> <ul style="list-style-type: none"> — 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_i; and

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			
						See paragraph 3.2.53 of DGP/23-WP/3: <u>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, sub-section 38.3.</u>
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	<u>4a)</u> carried by passengers or crew for personal use; <u>2b)</u> should be carried as carry-on baggage; and See paragraph 3.2.53 of DGP/23-WP/3: <u>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, sub-section 38.3.</u>
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	<u>4a)</u> carried by passengers or crew for personal use; <u>2b)</u> no more than two individually protected spare batteries per person; <u>3c)</u> 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 See paragraph 3.2.53 of DGP/23-WP/3: <u>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, sub-section 38.3.</u>

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			
20) Fuel cells used to power portable electronic devices (for example cameras, cellular phones, laptop computers and camcorders)	No	Yes	Yes	No	No	4a) fuel cell cartridges may only contain flammable liquids, corrosive substances, liquefied flammable gas, water reactive substances or hydrogen in metal hydride;
See paragraph 3.2.49 of DGP/23-WP/3:						2b) refuelling of fuel cells on board an aircraft is not permitted except that the installation of a spare cartridge is allowed;
Spare fuel cell cartridges containing flammable liquids, corrosive substances, liquefied flammable gas or hydrogen in metal hydride	Yes	Yes	Yes	No	No	3c) the maximum quantity of fuel in any fuel cell or fuel cell cartridge must not exceed: <ul style="list-style-type: none"> — for liquids 200 mL; — for solids 200 grams; — for liquefied gases, 120 mL for non-metallic fuel cell cartridges or 200 mL for metal fuel cell or fuel cell cartridges; and — for hydrogen in metal hydride, the fuel cell or fuel cell cartridges must have a water capacity of 120 mL or less;
Spare fuel cell cartridges containing water-reactive substances	No	Yes	Yes	No	No	<p>See paragraph 2.5.4 of this report:</p> 4d) each fuel cell and each fuel cell cartridge must conform to IEC PAS 62282-6-4 62282-6-100 Ed. 1 [and 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;
						5e) fuel cell cartridges containing hydrogen in metal hydride must comply with the requirements in Special Provision A162;
						6f) no more than two spare fuel cell cartridges may be carried by a passenger;
						7g) fuel cell containing fuel are permitted in carry-on baggage only;
						<p>See paragraph 2.5.4 of this report:</p> 8h) interaction between fuel cells and integrated batteries in a device must conform to IEC PAS 62282-6-4 62282-6-100 Ed. 1 [and Amendment 1] . Fuel cell whose sole function is to charge a battery in the device are not permitted;

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			
						<p>9i) fuel cells must be of a type that will not charge batteries when the portable electronic device is not in use and must be durably marked by the manufacturer: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to so indicate; and</p> <p>40j) in addition to the languages which may be required by the State of Origin for the markings specified above, English should be used.</p>
<p>21 Dry Ice)</p>	Yes	Yes	No	Yes	No	<p>4a) no more than 2.5 kg per person;</p> <p>2b) used to pack perishables that are not subject to these Instructions;</p> <p>3c) the package must permit the release of carbon dioxide gas; and</p> <p>4d) when carried in checked baggage, each package must be marked:</p> <ul style="list-style-type: none"> — "DRY ICE" or "CARBON DIOXIDE, SOLID"; and — the net weight of dry ice or an indication that the net weight is 2.5 kg or less.
<p>22 A mercurial barometer or) mercurial thermometer</p>	No	Yes	No	Yes	Yes	<p>4a) must be carried by a representative of a government weather bureau or similar official agency; and</p> <p>2b) must be packed in a strong outer packaging, having a sealed inner liner or a bag of strong leakproof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position.</p>
<p>23 Instruments containing) radioactive material (i.e. chemical agent monitor (CAM) and/or rapid alarm and identification device monitor (RAID-M))</p>	Yes	Yes	No	Yes	No	<p>4a) the instruments must not exceed the activity limits specified in Table 2-15 of these Instructions;</p> <p>2b) must be securely packed and without lithium batteries; and</p> <p>3c) must be carried by staff members of the Organization for the Prohibition of Chemical Weapons (OPCW) on official travel.</p>
<p>24 Energy efficient light bulbs)</p>	Yes	Yes	Yes	No	No	<p>4a) when in retail packaging; and</p> <p>2b) intended for personal or home use.</p>

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			

See paragraph 2.2.2 of this report:

<u>25) Permeation devices for calibrating air quality monitoring equipment</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Must comply with Special Provision A41.</u>
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See paragraphs 2.9.2 and 2.2.2 of this report:

<u>26) Portable electronic equipment containing a non-spillable battery meeting the requirements of Special Provision A67</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>a) the battery must not have a voltage greater than 12 volts and a watt-hour rating of not greater than 100 Wh; and</u> <u>b) the equipment must be either protected from inadvertent activation, or the battery disconnected and exposed terminals insulated.</u>
<u>Spare non-spillable batteries meeting the requirements of Special Provision A67</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>a) the battery must not have a voltage greater than 12 volts and a watt-hour rating of not greater than 100 Wh;</u> <u>b) the battery must be protected from short circuit by the effective insulation of exposed terminals; and</u> <u>c) no more than two individually protected batteries per person.</u>

See paragraph 2.2.2 of this report:

<u>27) Internal combustion engines or fuel cell engines</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Must comply with Special Provision A70</u>
<u>28) Non-infectious specimens</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Must comply with Special Provision A180</u>
<u>29) Insulated packagings containing refrigerated liquid nitrogen</u>	<u>Yes</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>Must comply with Special Provision A152</u>

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			
Security-type equipment						
<p>y30 Security type equipment such as attaché cases, cash boxes, cash bags, etc. incorporating dangerous goods as part of this equipment, for example lithium batteries or pyrotechnic material</p>	Yes	No	No	Yes	No	<p>a4) the equipment must be equipped with an effective means of preventing accidental activation;</p> <p>2b) if the equipment contains an explosive or pyrotechnic substance or an explosive article, this article or substance must be excluded from Class 1 by the appropriate national authority of the State of Manufacture in compliance with Part 2;1.5.2.1;</p> <p>3c) if the equipment contains lithium cells or batteries, these cells or batteries must comply with the following restrictions:</p> <ul style="list-style-type: none"> — for a lithium metal cell, the lithium content is not more than 1 g; — for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g; — for lithium ion cells, the Watt-hour rating (see the Glossary of Terms in Attachment 2) is not more than 20 Wh; — for lithium ion batteries, the Watt-hour rating is not more than 100 Wh; — each cell or battery is of the type proven to meet the requirements of each test in the UN <i>Manual of Tests and Criteria</i>, Part III, sub-section 38.3; <p>4d) if the equipment contains gases to expel dye or ink,</p> <ul style="list-style-type: none"> — only gas cartridges and receptacles, small, containing gas with a capacity not exceeding 50 mL, containing no constituents subject to these Instructions other than a Division 2.2 gas, are allowed; — The release of gas must not cause extreme annoyance or discomfort to crew members so as to prevent the correct performance of assigned duties; and — In case of accidental activation, all hazardous effects must be confined within the equipment and must not produce extreme noise; and <p>5e) security type equipment that is defective or that has been damaged is forbidden for transport.</p>

...

Attachment 2 GLOSSARY OF TERMS

Glossary of terms

Term and explanation	UN Number(s), when relevant
...	
See paragraph 2.9.7 of this report:	
<p>ARTICLES, EXPLOSIVE, EXTREMELY INSENSITIVE (ARTICLES, EEI). Articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation (under normal conditions of transport).</p> <p><i>Note.— An extremely insensitive detonating substance is a substance which although capable of sustaining a detonation has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation.</i></p>	0486
...	
<p>AUXILIARY EXPLOSIVE COMPONENT, isolated. An "isolated auxiliary explosive component" is a small device that explosively performs an operation related to the article's functioning, other than its main explosive loads' performance. Functioning of the component does not cause any reaction of the main explosive loads contained within the article.</p>	
...	
<p>EXPLOSIVE, EXTREMELY INSENSITIVE DETONATING SUBSTANCE (EIDS) (EIS). A substance which, although capable of sustaining a detonation, has demonstrated through tests that it is so insensitive that there is very little probability of accidental initiation.</p>	—
...	
See paragraph 3.2.1 of DGP/23-WP/2 and paragraph 3.2.60 of DGP/23-WP/3:	
<p>LITHIUM BATTERY OR LITHIUM CELLS. A battery is one or more cells which are electrically connected together by a permanent means. A cell is a single encased electromechanical unit which exhibits a voltage differential across its two terminals. Two or more cells which are electrically connected together and fitted with devices necessary for use, for example, case, terminals, marking and protective devices. A single cell battery is considered a "cell" and must be tested according to the testing requirements for "cells" for the purposes of the Technical Instructions and the UN Manual of Tests and Criteria (see also the explanation for "lithium cell").</p> <p><i>Note.— Units that are commonly referred to as "battery packs", "modules" or "battery assemblies" having the primary function of providing a source of power to another piece of equipment are for the purposes of the Technical Instructions and the UN Manual of Tests and Criteria treated as batteries.</i></p>	3090, 3091, <u>3480, 3481</u>
<p>LITHIUM CELL. A single encased electrochemical unit (one positive and one negative electrode) which exhibits a voltage differential across its two terminals. Under the Technical Instructions and the UN Manual of Tests and Criteria, to the extent the encased electrochemical unit meets the definition of "cell" herein, it is a "cell", not a "battery", regardless of whether the unit is termed a "battery" or a "single cell battery" outside of the Technical Instructions and the UN Manual of Tests and Criteria.</p>	3090, 3091, <u>3480, 3481</u>
...	
See paragraph 2.9.6 of this report:	
<p>PREMIXING BURNER LIGHTER. Gas lighter in which fuel and air are mixed before being supplied for combustion, such as lighters producing a blue flame.</p>	

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
<input checked="" type="checkbox"/>												
* Aldehyde, see Acetaldehyde												
≠ Aldehyde, see Aldehydes, n.o.s. (UN No. 1989)												
<input checked="" type="checkbox"/>												
* Alkyl aluminium halides, see Aluminium alkyl halides												
≠ Alkyl aluminium halides, see Organometallic substance, solid, pyrophoric, water-reactive (UN No. 3393) or Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
<input checked="" type="checkbox"/>												
* Asbestos †, see Blue asbestos or Brown asbestos												
≠ Asbestos †, see Blue asbestos, Brown asbestos or White asbestos												
<input checked="" type="checkbox"/>												
* Battery, lithium, see Lithium batteries, etc.												
≠ Battery, lithium ion, see Lithium ion batteries, etc. (UN Nos. 3480, 3481)												
<input checked="" type="checkbox"/>												
* Bifluorides, n.o.s., see Hydrogendifluorides, n.o.s.												
≠ Bifluorides, n.o.s., see Hydrogendifluorides, solid, n.o.s. (UN No. 1740)												
<input checked="" type="checkbox"/>												
* Butyl lithium, see Lithium alkyls												
≠ Butyl lithium, see Organometallic substance, liquid, pyrophoric, water reactive (UN No. 3394)												

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
<input checked="" type="checkbox"/>												
* But-1-yne, see Ethyl acetylene												
≠ But-1-yne, see Ethylacetylene, stabilized (UN No. 2452)												
<input checked="" type="checkbox"/>												
* Casinghead gasoline, see Natural gasoline												
≠ Casinghead gasoline, see Gasoline or Petrol or Motor spirit (UN No. 1203)												
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
* Electric storage batteries, see Batteries , etc.												
>												
<input checked="" type="checkbox"/>												
* Magnesium chloride and chlorate mixture, see Chlorate and magnesium chloride mixture												
≠ Magnesium chloride and chlorate mixture, see Chlorate and magnesium chloride mixture , solid (UN No. 1459) or Chlorate and magnesium chloride mixture solution (UN No. 3407)												
<input checked="" type="checkbox"/>												
* Chlorotrifluoroethylene, see Trifluorochloroethylene, inhibited												
≠ Chlorotrifluoroethylene, see Trifluorochloroethylene, stabilized (UN No. 1082)												
<input checked="" type="checkbox"/>												
* Cyanides, organic, toxic, n.o.s., see Nitriles, toxic, n.o.s.												
≠ Cyanides, organic, toxic, n.o.s., see Nitriles, liquid, toxic, n.o.s. (UN No. 3276) or Nitriles, solid, toxic, n.o.s. (UN No. 3439)												

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
<input checked="" type="checkbox"/>												
* Deanol, see Dimethylethanolamine												
≠ Deanol, see 2-Dimethylaminoethanol (UN No. 2051)												
<input checked="" type="checkbox"/>												
* 2-Diethylaminoethanol, see Diethylaminoethanol												
≠ Diethylaminoethanol, see 2-Diethylaminoethanol (UN. 2686)												
<input checked="" type="checkbox"/>												
* Diethylcarbinol, see Amyl alcohols												
≠ Diethylcarbinol, see Pentanol s (UN No. 1105)												
<input checked="" type="checkbox"/>												
* Dinitrochlorobenzenes, see Chlorodinitrobenzenes												
≠ Dinitrochlorobenzenes, see Chlorodinitrobenzenes, liquid (UN No. 1577) or Chlorodinitrobenzenes, solid (UN No. 3441)												
<input checked="" type="checkbox"/>												
* Fertilizer with ammonium nitrate, n.o.s., see Ammonium nitrate fertilizer, n.o.s.												
≠ Fertilizer with ammonium nitrate, n.o.s., see Ammonium nitrate based fertilizer (UN No. 2067) or Ammonium nitrate based fertilizers (UN No. 2071)												
<input checked="" type="checkbox"/>												
* Fluoric acid, see Hydrofluoric acid, solution , etc.												
≠ Fluoric acid, see Hydrofluoric acid (UN No. 1790)												

Chapter 2

3-2-5

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
✓												
* Heavy hydrogen, see Deuterium												
≠ Heavy hydrogen, see Deuterium, compressed (UN No. 1957)												
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
* Isopropyl bromide, see 2-Bromopropane												
>												
✓												
* Jet tappers, without detonator, see Charges, shaped, commercial												
≠ Jet tappers, without detonator, see Charges, shaped (UN Nos. 0059, 0439, 0440, 0441)												
✓												
* Lead (II) perchlorate, see Lead perchlorate												
≠ Lead (II) perchlorate, see Lead perchlorate, solid (UN No. 1470) or Lead perchlorate solution (UN No. 3408)												
✓												
* 1-Methoxy-2-nitrobenzene, see Nitroanisole												
≠ 1-Methoxy-2-nitrobenzene, see Nitroanisoles, liquid (UN No. 2730) or Nitroanisoles, solid (UN No. 3458)												
✓												
* 1-Methoxy-3-nitrobenzene, see Nitroanisole												
≠ 1-Methoxy-3-nitrobenzene, see Nitroanisoles, liquid (UN No. 2730) or Nitroanisoles, solid (UN No. 3458)												

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
<input checked="" type="checkbox"/>												
* 1-Methoxy-4-nitrobenzene, see Nitroanisole												
≠ 1-Methoxy-4-nitrobenzene, see Nitroanisoles, liquid (UN No. 2730) or Nitroanisoles, solid (UN No. 3458)												
<input checked="" type="checkbox"/>												
* beta-Methyl acrolein, see Crotonaldehyde, stabilized												
≠ beta-Methyl acrolein, see Crotonaldehyde or Crotonaldehyde, stabilized (UN No. 1143)												
<input checked="" type="checkbox"/>												
* Methyl amyl ketone, see Amyl methyl ketone												
≠ Methyl amyl ketone, see n-Amyl methyl ketone (UN No. 1110)												
<input checked="" type="checkbox"/>												
* Methyl ethyl ketone peroxide(s), more than 50%	FORBIDDEN											
≠ Methyl ethyl ketone peroxide(s), 48% or more if available oxygen above 10% and not more than 10.7% with or without water	FORBIDDEN											
<input checked="" type="checkbox"/>												
* Methyl mercaptopropionaldehyde, see 4-Thiapentanal												
≠ Methyl mercaptopropionaldehyde, see 4-Thiapentanal (UN No. 2785)												
<input checked="" type="checkbox"/>												
* Methylstyrene, inhibited, see Vinytoluenes, inhibited												
≠ Methylstyrene, stabilized, see Vinytoluenes, stabilized (UN No. 2618)												

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
<input checked="" type="checkbox"/>												
* Methyl vinyl benzene, inhibited, see Vinytoluene, inhibited												
≠ Methyl vinyl benzene, stabilized, see Vinytoluenes, stabilized (UN No. 2618)												
<input checked="" type="checkbox"/>												
* Non-activated carbon, see Carbon, animal or vegetable origin												
≠ Non-activated carbon, see Carbon (UN No. 1361)												
<input checked="" type="checkbox"/>												
* Non-activated charcoal, see Carbon, animal or vegetable origin												
≠ Non-activated charcoal, see Carbon (UN No. 1361)												
<input checked="" type="checkbox"/>												
* Orthophosphoric acid, see Phosphoric acid												
≠ Orthophosphoric acid, see Phosphoric acid, solution (UN No. 1805) or Phosphoric acid, solid (UN No. 3453)												
<input checked="" type="checkbox"/>												
* Phenylethylene, see Styrene monomer, inhibited												
≠ Phenylethylene, see Styrene monomer, stabilized (UN No. 2055)												
<input checked="" type="checkbox"/>												
* Picrotoxin, see Toxins, extracted from living sources, n.o.s.												
≠ Picrotoxin, see Toxins, extracted from living sources, liquid, n.o.s. (UN No. 3172) or Toxins, extracted from living sources, solid, n.o.s. (UN No. 3462)												

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
<input checked="" type="checkbox"/>												
* Potassium bifluoride, see Potassium hydrogendifluoride												
≠ Potassium bifluoride, see Potassium hydrogendifluoride, solid (UN No. 1811)												
<input checked="" type="checkbox"/>												
* Shaped charges, see Charges, shaped, commercial												
≠ Shaped charges, see Charges, shaped (UN Nos. 0059, 0439, 0440, 0441)												
<input checked="" type="checkbox"/>												
* Sodium potassium alloys, see Potassium sodium alloys												
≠ Sodium potassium alloys, see Potassium sodium alloys, liquid (UN No. 1422) or Potassium sodium alloys, solid (UN No. 3404)												
<input checked="" type="checkbox"/>												
* Sulphuretted hydrogen, see Hydrogen sulphide, liquefied												
≠ Sulphuretted hydrogen, see Hydrogen sulphide (UN No. 1053)												
<input checked="" type="checkbox"/>												
* Tetrafluorodichloroethane, see Dichlorotetrafluoroethane												
≠ Tetrafluorodichloroethane, see 1,2-Dichloro-1,1,2,2-tetrafluoroethane or Refrigerant gas R 114 (UN No. 1958)												
<input checked="" type="checkbox"/>												
* Trichloroacetaldehyde, see Chloral, anhydrous, stabilized												
≠ Trichloroacetaldehyde, see Chloral, anhydrous, stabilized (UN No. 2075)												

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
<input checked="" type="checkbox"/>												
* Trichloroacetaldehyde, see Chloral, anhydrous, inhibited												
≠ Trichloroacetaldehyde, see Chloral, anhydrous, stabilized (UN No. 2075)												
<input checked="" type="checkbox"/>												
* 2,4,4-Trimethylpentene-1, see Diisobutylene, isomeric compounds												
≠ 2,4,4-Trimethylpentene-1, see Diisobutylene, isomeric compounds (UN No. 2050)												
<input checked="" type="checkbox"/>												
* 2,4,4-Trimethylpentene-2, see Diisobutylene, isomeric compounds												
≠ 2,4,4-Trimethylpentene-2, see Diisobutylene, isomeric compounds (UN No. 2050)												
<input checked="" type="checkbox"/>												
* Villiamite, see Sodium fluoride												
≠ Villiamite, see Sodium fluoride, solid (UN No. 1690)												
+ Aluminium alkyl halides, liquid, see Organometallic substance, liquid, pyrophoric, water reactive (UN No. 3394)												
+ Aluminium alkyl halides, solid, see Organometallic substance, solid, pyrophoric, water reactive (UN No. 3393)												
+ Aluminium alkyl hydrides, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+ Aluminium alkyls, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												

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
+ Diethylzinc, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+ Dimethylzinc, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+ Lithium alkyls, liquid, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+ Lithium alkyls, solid, see Organometallic substance, solid, pyrophoric, water-reactive (UN No. 3393)												
+ Lithium alloy batteries, see Lithium metal batteries , etc. (UN Nos. 3090, 3091)												
+ Lithium ion polymer batteries, see Lithium ion batteries , etc. (UN Nos. 3480, 3481)												
+ Magnesium alkyls, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+ Magnesium diphenyl, see Organometallic substance, solid, pyrophoric, water-reactive (UN No. 3393)												
+ Formaldehyde solution with less than 25 per cent formaldehyde						A189						
+ Cupric chlorate, see Copper chlorate (UN No. 2721)												
+ 3-Pentanol, see Pentanois (UN No. 1105)												
+ tert-Amylperoxy-3,5,5-trimethylhexanoate		FORBIDDEN										
+ Disuccinic acid peroxide 72% or more		FORBIDDEN										
+ Battery, lithium metal, see Lithium metal batteries, etc. (UN Nos. 3090, 3091)												
+ Cartridges for tools, blank †	0014	1.4S		Explosive 1.4				E0	130	25 kg	130	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
* Ammonia, anhydrous	1005	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Ammonia, anhydrous	1005	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Boron trifluoride	1008	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	✓ A2			FORBIDDEN		FORBIDDEN	
≠ Boron trifluoride	1008	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2 A191			FORBIDDEN		FORBIDDEN	
* Carbon monoxide, compressed	1016	2.3	2.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Carbon monoxide, compressed	1016	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Chlorine	1017	2.3	5.1 8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chlorine	1017	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Coal gas, compressed †	1023	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Coal gas, compressed †	1023	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Cyanogen	1026	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Cyanogen	1026	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Ethylene oxide	1040	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3 US 4	A2 A131			FORBIDDEN		FORBIDDEN	
≠ Ethylene oxide	1040	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3 US 4	A2 A131			FORBIDDEN		FORBIDDEN	
* Fluorine, compressed	1045	2.3	5.1 8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Fluorine, compressed	1045	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen bromide, anhydrous	1048	2.3	8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hydrogen bromide, anhydrous	1048	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Hydrogen chloride, anhydrous	1050	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Hydrogen chloride, anhydrous	1050	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen sulphide	1053	2.3	2.1		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Hydrogen sulphide	1053	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Methyl bromide with not more than 2% chloropicrin	1062	2.3			☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Methyl bromide with not more than 2% chloropicrin	1062	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
* Methyl mercaptan	1064	2.3	2.1		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Methyl mercaptan	1064	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Dinitrogen tetroxide	1067	2.3	5.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Dinitrogen tetroxide	1067	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitrogen dioxide	1067	2.3	5.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Nitrogen dioxide	1067	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Nitrosyl chloride	1069	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitrosyl chloride	1069	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Oil gas, compressed †	1071	2.3	2.1	Gas toxic & Gas flammable	✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		200	25 kg
≠ Oil gas, compressed †	1071	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		200	25 kg
* Phosgene	1076	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Phosgene	1076	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Sulphur dioxide	1079	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Sulphur dioxide	1079	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Trifluorochloroethylene, stabilized	1082	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Trifluorochloroethylene, stabilized	1082	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 L
* Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 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
* Methyltrichlorosilane	1250	3	8	Liquid flammable & Corrosive	AU 1 CA 7 GB 3 IR 3 NL 1 US 3		II	E2	377	1 L	377	5 L
≠ Methyltrichlorosilane	1250	3	8	Liquid flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3		II	E0	FORBIDDEN		377	5 L
* Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	E2	377	1 L	377	5 L
≠ Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 L
* Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive	AU 1 CA 7 GB 3 IR 3 NL 1 US 3		II	E2	377	1 L	377	5 L
≠ Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3		II	E0	FORBIDDEN		377	5 L
* Chloropicrin and methyl bromide mixture with more than 2% chloropicrin	1581	2.3			AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chloropicrin and methyl bromide mixture with more than 2% chloropicrin	1581	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	

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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
* Chloropicrin and methyl chloride mixture	1582	2.3			☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Chloropicrin and methyl chloride mixture	1582	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Cyanogen chloride, stabilized	1589	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Cyanogen chloride, stabilized	1589	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hexaethyl tetraphosphate and compressed gas mixture	1612	2.3			☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Hexaethyl tetraphosphate and compressed gas mixture	1612	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
* Nitric oxide, compressed	1660	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitric oxide, compressed	1660	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Thallium compound, n.o.s.	1707	6.1		Toxic	US 4	A6	II	E4	669 Y644	25 kg 1 kg	676	100 kg
≠ Thallium compound, n.o.s.*	1707	6.1		Toxic	US 4	A6	II	E4	669 Y644	25 kg 1 kg	676	100 kg
* Boron trichloride	1741	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Boron trichloride	1741	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chlorine trifluoride	1749	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chlorine trifluoride	1749	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>							
* Iodine monochloride	1792	8		Corrosive	AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		863	50 kg
≠ Iodine monochloride, solid	1792	8		Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		863	50 kg
<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>							
* Silicon tetrafluoride	1859	2.3	8		AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Silicon tetrafluoride	1859	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>							
* Diborane	1911	2.3	2.1		AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Diborane	1911	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Compressed gas, toxic, flammable, n.o.s.*	1953	2.3	2.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, flammable, n.o.s.*	1953	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, n.o.s.*	1955	2.3			✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, n.o.s.*	1955	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Insecticide gas, toxic, n.o.s.*	1967	2.3			✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Insecticide gas, toxic, n.o.s.*	1967	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Insecticide gas, n.o.s.*	1968	2.2		Gas non-flammable				E1	✓ 200 or 203 Y203	✓ 75 kg 30 kg G	✓ 200 or 203	150 kg
≠ Insecticide gas, n.o.s.*	1968	2.2		Gas non-flammable				E1	200	75 kg	200	150 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
*	Nitric oxide and dinitrogen tetroxide mixture	1975	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Nitric oxide and dinitrogen tetroxide mixture	1975	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Nitric oxide and nitrogen dioxide mixture	1975	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Nitric oxide and nitrogen dioxide mixture	1975	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Gas cartridges (toxic) without a release device, non-refillable	2037	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Gas cartridges (toxic) without a release device, non-refillable	2037	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
* Gas cartridges (toxic & corrosive) without a release device, non-refillable	2037	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Gas cartridges (toxic & corrosive) without a release device, non-refillable	2037	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Gas cartridges (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Gas cartridges (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Gas cartridges (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Gas cartridges (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Gas cartridges (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Gas cartridges (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Gas cartridges (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Gas cartridges (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Receptacles, small, containing gas (toxic) without a release device, non-refillable	2037	2.3			☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Receptacles, small, containing gas (toxic) without a release device, non-refillable	2037	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
Receptacles, small, containing gas (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	8		<div>☑</div> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		<div>☑</div> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		<div>☑</div> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Receptacles, small, containing gas (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Receptacles, small, containing gas (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Receptacles, small, containing gas (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Receptacles, small, containing gas (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Ammonium nitrate fertilizers	2071	9		Miscellaneous		A89 A90	III		958 Y958	200 kg 30 kg G	958	200 kg
≠ Ammonium nitrate based fertilizers	2071	9		Miscellaneous		A89 A90	III		958 Y958	200 kg 30 kg G	958	200 kg
* Arsine	2188	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Arsine	2188	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Dichlorosilane	2189	2.3	2.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Dichlorosilane	2189	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Oxygen difluoride, compressed	2190	2.3	5.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Oxygen difluoride, compressed	2190	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Sulphuryl fluoride	2191	2.3			✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Sulphuryl fluoride	2191	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
* Germane	2192	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Germane	2192	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Selenium hexafluoride	2194	2.3	8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Selenium hexafluoride	2194	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Tellurium hexafluoride	2195	2.3	8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Tellurium hexafluoride	2195	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Tungsten hexafluoride	2196	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Tungsten hexafluoride	2196	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen iodide, anhydrous	2197	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Hydrogen iodide, anhydrous	2197	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Phosphorus pentafluoride	2198	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Phosphorus pentafluoride	2198	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Phosphine	2199	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Phosphine	2199	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen selenide, anhydrous	2202	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hydrogen selenide, anhydrous	2202	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Carbonyl sulphide	2204	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Carbonyl sulphide	2204	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Dimethyl disulphide	2381	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Liquid flammable			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 353 Y341	<input checked="" type="checkbox"/> 5 L 1 L	<input checked="" type="checkbox"/> 364	<input checked="" type="checkbox"/> 60 L
≠ Dimethyl disulphide	2381	3	6.1				II	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
* Carbonyl fluoride	2417	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Carbonyl fluoride	2417	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hexafluoroacetone	2420	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Hexafluoroacetone	2420	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitrogen trioxide	2421	2.3	5.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Nitrogen trioxide	2421	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
*	Methylchlorosilane	2534	2.3	2.1 8		<div>☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div>	A2			FORBIDDEN		FORBIDDEN	
≠	Methylchlorosilane	2534	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Chlorine pentafluoride	2548	2.3	5.1 8		<div>☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div>	A2			FORBIDDEN		FORBIDDEN	
≠	Chlorine pentafluoride	2548	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	<div>☑</div> Alkylsulphuric acids*	2571	8		Corrosive			II	E2	851 Y840	1 L 0.5 L	855	30 L
≠	Alkylsulphuric acids	2571	8		Corrosive			II	E2	851 Y840	1 L 0.5 L	855	30 L
*	Stibine	2676	2.3	2.1		<div>☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div>	A2			FORBIDDEN		FORBIDDEN	
≠	Stibine	2676	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Batteries, wet, filled with acid, electric storage †	2794	8		Corrosive		A51 A164 A183		E0	870	<input checked="" type="checkbox"/> 30 kg G	870	No limit
≠ Batteries, wet, filled with acid, electric storage †	2794	8		Corrosive		A51 A164 A183		E0	870	30 kg	870	No limit
* Batteries, wet, filled with alkali, electric storage †	2795	8		Corrosive		A51 A164 A183		E0	870	<input checked="" type="checkbox"/> 30 kg G	870	No limit
≠ Batteries, wet, filled with alkali, electric storage †	2795	8		Corrosive		A51 A164 A183		E0	870	30 kg	870	No limit
* Mercury	2809	8	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Corrosive	US 4		III	E0	868	35 kg	868	35 kg
≠ Mercury	2809	8	6.1	Corrosive & Toxic	US 4		III	E0	868	35 kg	868	35 kg
* Bromine chloride	2901	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Bromine chloride	2901	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 L
* Batteries, dry, containing potassium hydroxide solid, electric storage †	3028	8		Corrosive		<input checked="" type="checkbox"/> A183		E0	871	<input checked="" type="checkbox"/> 25 kg G	871	<input checked="" type="checkbox"/> 230 kg G
≠ Batteries, dry, containing potassium hydroxide solid, electric storage †	3028	8		Corrosive		A183 A184		E0	871	25 kg	871	230 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
* Trifluoroacetyl chloride	3057	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Trifluoroacetyl chloride	3057	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin	3064	3		Liquid flammable	<input checked="" type="checkbox"/> BE 3		II	E0	FORBIDDEN		371	5 L
≠ Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin	3064	3		Liquid flammable	BE 3	A188	II	E0	FORBIDDEN		371	5 L
* Perchloryl fluoride	3083	2.3	5.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Perchloryl fluoride	3083	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	II	E0	968	<input checked="" type="checkbox"/> 2.5 kg G	968	<input checked="" type="checkbox"/> 35 kg G
≠ Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	II	E0	968	2.5 kg	968	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 contained in equipment (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	✓ A48 A99 A154 A164 A181	II	E0	✓ see	✓ 970	✓ see	✓ 970
≠ 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 packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	✓ A99 A154 A164 A181	II	E0	✓ see	✓ 969	✓ see	✓ 969
≠ Lithium metal batteries packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A99 A154 A181 A185	II	E0	969	5 kg	969	35 kg
* Liquefied gas, toxic, flammable, n.o.s.*	3160	2.3	2.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, flammable, n.o.s.*	3160	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
					<input checked="" type="checkbox"/>							
* Liquefied gas, toxic, n.o.s.*	3162	2.3			AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, n.o.s.*	3162	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
										<input checked="" type="checkbox"/>		
* Polyester resin kit †	3269	3		Liquid flammable		A66 A163	II III	E0 E0	370 Y370 370 Y370	5 kg 1 kg 5 kg 1 kg	370 370	5 kg 5 kg
≠ Polyester resin kit †	3269	3		Liquid flammable		A66 A163	II III	E0 E0	370 Y370 370 Y370	5 kg 1 kg 10 kg 5 kg	370 370	5 kg 10 kg
<input checked="" type="checkbox"/>												
* Nitriles, toxic, liquid, n.o.s.*	3276	6.1		Toxic		A3 A4 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
≠ Nitriles, liquid, toxic, n.o.s.*	3276	6.1		Toxic		A3 A4 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
<input checked="" type="checkbox"/>												
* Organophosphorus compound, toxic, liquid, n.o.s.*	3278	6.1		Toxic		A3 A4 A6 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
≠ Organophosphorus compound, liquid, toxic, n.o.s.*	3278	6.1		Toxic		A3 A4 A6 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	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
<input checked="" type="checkbox"/>												
* Organometallic compound, toxic, liquid, n.o.s.*	3282	6.1		Toxic		A3 A4	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
≠ Organometallic compound, liquid, toxic, n.o.s.*	3282	6.1		Toxic		A3 A4	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
* Cells, containing sodium †	3292	4.3		Danger if wet		A94	II	E0	492	<input checked="" type="checkbox"/> 25 kg G	492	No limit
≠ Cells, containing sodium †	3292	4.3		Danger if wet		A94	II	E0	492	25 kg	492	No limit
* Ethylene oxide and carbon dioxide mixture, with more than 87% ethylene oxide	3300	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3 US 4	A2			FORBIDDEN		FORBIDDEN	
≠ Ethylene oxide and carbon dioxide mixture, with more than 87% ethylene oxide	3300	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3 US 4	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, oxidizing, n.o.s.*	3303	2.3	5.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, oxidizing, n.o.s.*	3303	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Compressed gas, toxic, corrosive, n.o.s.*	3304	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, corrosive, n.o.s.*	3304	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, flammable, corrosive, n.o.s.*	3305	2.3	2.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, flammable, corrosive, n.o.s.*	3305	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, oxidizing, corrosive, n.o.s.*	3306	2.3	5.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, oxidizing, corrosive, n.o.s.*	3306	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Liquefied gas, toxic, oxidizing, n.o.s.*	3307	2.3	5.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, oxidizing, n.o.s.*	3307	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Liquefied gas, toxic, corrosive, n.o.s.*	3308	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, corrosive, n.o.s.*	3308	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Liquefied gas, toxic, flammable, corrosive, n.o.s.*	3309	2.3	2.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, flammable, corrosive, n.o.s.*	3309	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	

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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
* Liquefied gas, toxic, oxidizing, corrosive, n.o.s.*	3310	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, oxidizing, corrosive, n.o.s.*	3310	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Ammonia solution, relative density less than 0.880 at 15°C in water, with more than 50% ammonia	3318	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Ammonia solution, relative density less than 0.880 at 15°C in water, with more than 50% ammonia	3318	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Aviation regulated liquid, n.o.s.*	3334	9		Miscellaneous		A27	III	E1	964 Y964	<input checked="" type="checkbox"/> No limit 30 kg G	964	<input checked="" type="checkbox"/> No limit
≠ Aviation regulated liquid, n.o.s.*	3334	9		Miscellaneous		A27	III	E1	964 Y964	450 L 30 kg G	964	450 L
* Aviation regulated solid, n.o.s.*	3335	9		Miscellaneous		A27	III	E1	956 Y956	<input checked="" type="checkbox"/> No limit 30 kg G	956	<input checked="" type="checkbox"/> No limit
≠ Aviation regulated solid, n.o.s.*	3335	9		Miscellaneous		A27	III	E1	956 Y956	400 kg 30 kg G	956	400 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
* Insecticide gas, toxic, flammable, n.o.s.*	3355	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Insecticide gas, toxic, flammable, n.o.s.*	3355	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chlorosilanes, toxic, corrosive, n.o.s.*	3361	6.1	8	Toxic & Corrosive			II	<input checked="" type="checkbox"/> E4	<input checked="" type="checkbox"/> 681	<input checked="" type="checkbox"/> 1 L	681	30 L
≠ Chlorosilanes, toxic, corrosive, n.o.s.*	3361	6.1	8	Toxic & Corrosive			II	E0	FORBIDDEN		681	30 L
* Chlorosilanes, toxic, corrosive, flammable, n.o.s.*	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E4	<input checked="" type="checkbox"/> 681	<input checked="" type="checkbox"/> 1 L	681	30 L
≠ Chlorosilanes, toxic, corrosive, flammable, n.o.s.*	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	E0	FORBIDDEN		681	30 L
<input checked="" type="checkbox"/> * Toxic by inhalation liquid, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3381	6.1							FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3381	6.1							FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Toxic by inhalation liquid, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3382	6.1							FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3382	6.1							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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3383	6.1	3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3383	6.1	3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3384	6.1	3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3384	6.1	3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3385	6.1	4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3385	6.1	4.3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3386	6.1	4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3386	6.1	4.3						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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, oxidizing, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3387	6.1	5.1						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, oxidizing, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3387	6.1	5.1						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, oxidizing, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3388	6.1	5.1						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, oxidizing, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3388	6.1	5.1						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3389	6.1	8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3389	6.1	8						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3390	6.1	8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3390	6.1	8						FORBIDDEN		FORBIDDEN	

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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
<input checked="" type="checkbox"/>												
* Nitriles, toxic, solid, n.o.s.*	3439	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
≠ Nitriles, solid, toxic, n.o.s.*	3439	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
<input checked="" type="checkbox"/>												
* Organophosphorus compound, toxic, solid, n.o.s.*	3464	6.1		Toxic		A3 A5 A6	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
≠ Organophosphorus compound, solid, toxic, n.o.s.*	3464	6.1		Toxic		A3 A5 A6	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
<input checked="" type="checkbox"/>												
* Organometallic compound, toxic, solid, n.o.s.*	3467	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
≠ Organometallic compound, solid, toxic, n.o.s.*	3467	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
<input checked="" type="checkbox"/>												
* Hydrogen in a metal hydride storage system	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	<input checked="" type="checkbox"/> 100 kg G
≠ Hydrogen in a metal hydride storage system	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	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
* Hydrogen in a metal hydride storage system contained in equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	<input checked="" type="checkbox"/> 100 kg G
≠ Hydrogen in a metal hydride storage system contained in equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	100 kg
* Hydrogen in a metal hydride storage system packed with equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	<input checked="" type="checkbox"/> 100 kg G
≠ Hydrogen in a metal hydride storage system packed with equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	100 kg
* Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A183	II	E0	965	<input checked="" type="checkbox"/> 5 kg G	965	<input checked="" type="checkbox"/> 35 kg G
≠ Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A51 A88 A99 A154 A164 A183	II	E0	965	5 kg	965	35 kg

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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	II	E0	✓ see	✓ 967	✓ see	✓ 967
≠ 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 packed with equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	✓ A88 A99 A154 A164 A181	II	E0	✓ see	✓ 966	✓ see	✓ 966
≠ 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
* Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3488	6.1	3 8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3488	6.1	3 8						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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3489	6.1	3 8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3489	6.1	3 8						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3490	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3490	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3491	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3491	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
* Toxic by inhalation liquid, corrosive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3492	6.1	3 8						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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
* Toxic by inhalation liquid, corrosive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3493	6.1	3 8						FORBIDDEN		FORBIDDEN	
>												
+ Iodine monochloride, liquid	3498	8		Corrosive			II	E2	851	1.0 L	855	30 L
+ 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
+ Chemical under pressure, n.o.s.*	3500	2.2		Gas non-flammable		A187		E0	218	75 kg	218	150 kg
+ Chemical under pressure, flammable, n.o.s.*	3501	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, toxic, n.o.s.*	3502	2.2	6.1	Gas non-flammable & Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	100 kg
+ Chemical under pressure, corrosive, n.o.s.*	3503	2.2	8	Gas non-flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	100 kg
+ Chemical under pressure, flammable, toxic, n.o.s.*	3504	2.1	6.1	Gas flammable & Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, flammable, corrosive, n.o.s.*	3505	2.1	8	Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	75 kg
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						
* Mercury contained in manufactured articles	2809	8		Corrosive		A48 A69	III	E0	869	No limit	869	No limit
≠ Mercury contained in manufactured articles	3506	8	6.1	Corrosive & Toxic		A48 A69 A192	III	E0	869	No limit	869	No limit

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
<input checked="" type="checkbox"/> *												
Aldehyde, see Acetaldehyde												
≠												
Aldehyde, see Aldehydes, n.o.s. (UN No. 1989)												
<input checked="" type="checkbox"/> *												
Alkyl aluminium halides, see Aluminium alkyl halides												
≠												
Alkyl aluminium halides, see Organometallic substance, solid, pyrophoric, water-reactive (UN No. 3393) or Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
<input checked="" type="checkbox"/> *												
Alkylsulphuric acids*	2571	8		Corrosive			II	E2	851 Y840	1 L 0.5 L	855	30 L
≠												
Alkylsulphuric acids	2571	8		Corrosive			II	E2	851 Y840	1 L 0.5 L	855	30 L
+												
Aluminium alkyl halides, liquid, see Organometallic substance, liquid, pyrophoric, water reactive (UN No. 3394)												
+												
Aluminium alkyl halides, solid, see Organometallic substance, solid, pyrophoric, water reactive (UN No. 3393)												
+												
Aluminium alkyl hydrides, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+												
Aluminium alkyls, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												

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
* Ammonia, anhydrous	1005	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Ammonia, anhydrous	1005	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Ammonia solution , relative density less than 0.880 at 15°C in water, with more than 50% ammonia	3318	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Ammonia solution , relative density less than 0.880 at 15°C in water, with more than 50% ammonia	3318	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Ammonium nitrate fertilizers	2071	9		Miscellaneous		A89 A90	III		958 Y958	200 kg 30 kg G	958	200 kg
≠ Ammonium nitrate based fertilizers	2071	9		Miscellaneous		A89 A90	III		958 Y958	200 kg 30 kg G	958	200 kg
+ tert-Amylperoxy-3,5,5-trimethylhexanoate	FORBIDDEN											
* Arsine	2188	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Arsine	2188	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
<input checked="" type="checkbox"/>												
* Asbestos †, see Blue asbestos or Brown asbestos												
≠ Asbestos †, see Blue asbestos , Brown asbestos or White asbestos												
* Aviation regulated liquid, n.o.s.*	3334	9		Miscellaneous		A27	III	E1	964 Y964	<input checked="" type="checkbox"/> No limit 30 kg G	964	<input checked="" type="checkbox"/> No limit
≠ Aviation regulated liquid, n.o.s.*	3334	9		Miscellaneous		A27	III	E1	964 Y964	450 L 30 kg G	964	450 L
* Aviation regulated solid, n.o.s.*	3335	9		Miscellaneous		A27	III	E1	956 Y956	<input checked="" type="checkbox"/> No limit 30 kg G	956	<input checked="" type="checkbox"/> No limit
≠ Aviation regulated solid, n.o.s.*	3335	9		Miscellaneous		A27	III	E1	956 Y956	400 kg 30 kg G	956	400 kg
* Batteries, dry, containing potassium hydroxide solid, electric storage †	3028	8		Corrosive		<input checked="" type="checkbox"/> A183		E0	871	<input checked="" type="checkbox"/> 25 kg G	871	<input checked="" type="checkbox"/> 230 kg G
≠ Batteries, dry, containing potassium hydroxide solid, electric storage †	3028	8		Corrosive		A183 A184		E0	871	25 kg	871	230 kg
* Batteries, wet, filled with acid, electric storage †	2794	8		Corrosive		A51 A164 A183		E0	870	<input checked="" type="checkbox"/> 30 kg G	870	No limit
≠ Batteries, wet, filled with acid, electric storage †	2794	8		Corrosive		A51 A164 A183		E0	870	30 kg	870	No limit
* Batteries, wet, filled with alkali, electric storage †	2795	8		Corrosive		A51 A164 A183		E0	870	<input checked="" type="checkbox"/> 30 kg G	870	No limit
≠ Batteries, wet, filled with alkali, electric storage †	2795	8		Corrosive		A51 A164 A183		E0	870	30 kg	870	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
<input checked="" type="checkbox"/>												
* Battery, lithium, see Lithium batteries, etc.												
≠ Battery, lithium ion, see Lithium ion batteries, etc. (UN Nos. 3480, 3481)												
+ Battery, lithium metal, see Lithium metal batteries, etc. (UN Nos. 3090, 3091)												
<input checked="" type="checkbox"/>												
* Bifluorides, n.o.s., see Hydrogendifluorides, n.o.s.												
≠ Bifluorides, n.o.s., see Hydrogendifluorides, solid, n.o.s. (UN No. 1740)												
<input checked="" type="checkbox"/>												
* Boron trichloride	1741	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Boron trichloride	1741	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Boron trifluoride	1008	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	<input checked="" type="checkbox"/> A2			FORBIDDEN		FORBIDDEN	
≠ Boron trifluoride	1008	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2 A191			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
* Bromine chloride	2901	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Bromine chloride	2901	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Butyl lithium, see Lithium alkyls												
≠ Butyl lithium, see Organometallic substance, liquid, pyrophoric, water reactive (UN No. 3394)												
<input checked="" type="checkbox"/> * But-1-yne, see Ethyl acetylene												
≠ But-1-yne, see Ethylacetylene, stabilized (UN No. 2452)												
+ 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
* Carbon monoxide, compressed	1016	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Carbon monoxide, compressed	1016	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	

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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
* Carbonyl fluoride	2417	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Carbonyl fluoride	2417	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Carbonyl sulphide	2204	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Carbonyl sulphide	2204	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ Cartridges for tools, blank †	0014	1.4S		Explosive 1.4				E0	130	25 kg	130	100 kg
* Casinghead gasoline, see Natural gasoline												
≠ Casinghead gasoline, see Gasoline or Petrol or Motor spirit (UN No. 1203)												
* Cells, containing sodium †	3292	4.3		Danger if wet		A94	II	E0	492	<input checked="" type="checkbox"/> 25 kg G	492	No limit
≠ Cells, containing sodium †	3292	4.3		Danger if wet		A94	II	E0	492	25 kg	492	No limit
+ Chemical under pressure, n.o.s.*	3500	2.2		Gas non-flammable		A187		E0	218	75 kg	218	150 kg
+ Chemical under pressure, corrosive, n.o.s.*	3503	2.2	8	Gas non-flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	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
+ Chemical under pressure, flammable, n.o.s.*	3501	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, flammable, corrosive, n.o.s.*	3505	2.1	8	Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, flammable, toxic, n.o.s.*	3504	2.1	6.1	Gas flammable & Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, toxic, n.o.s.*	3502	2.2	6.1	Gas non-flammable & Toxic	AU 1 CA 7 IR 3 NL 1 US 3	A1 A187		E0	FORBIDDEN		218	100 kg
* Chlorine	1017	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chlorine	1017	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chlorine pentafluoride	2548	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chlorine pentafluoride	2548	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	

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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
* Chlorine trifluoride	1749	2.3	5.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chlorine trifluoride	1749	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chloropicrin and methyl bromide mixture with more than 2% chloropicrin	1581	2.3			✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chloropicrin and methyl bromide mixture with more than 2% chloropicrin	1581	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chloropicrin and methyl chloride mixture	1582	2.3			✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Chloropicrin and methyl chloride mixture	1582	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	✓ E2	✓ 377	✓ 1 L	377	5 L
≠ Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 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
* Chlorosilanes, toxic, corrosive, n.o.s.*	3361	6.1	8	Toxic & Corrosive			II	<input checked="" type="checkbox"/> E4	<input checked="" type="checkbox"/> 681	<input checked="" type="checkbox"/> 1 L	681	30 L
≠ Chlorosilanes, toxic, corrosive, n.o.s.*	3361	6.1	8	Toxic & Corrosive			II	E0	FORBIDDEN		681	30 L
* Chlorosilanes, toxic, corrosive, flammable, n.o.s.*	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E4	<input checked="" type="checkbox"/> 681	<input checked="" type="checkbox"/> 1 L	681	30 L
≠ Chlorosilanes, toxic, corrosive, flammable, n.o.s.*	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	E0	FORBIDDEN		681	30 L
<input checked="" type="checkbox"/> * Chlorotrifluoroethylene, see Trifluorochloroethylene, inhibited												
≠ Chlorotrifluoroethylene, see Trifluorochloroethylene, stabilized (UN No. 1082)												
* Coal gas, compressed †	1023	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Coal gas, compressed †	1023	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, n.o.s.*	1955	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, n.o.s.*	1955	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
* Compressed gas, toxic, corrosive, n.o.s.*	3304	2.3	8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Compressed gas, toxic, corrosive, n.o.s.*	3304	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, flammable, n.o.s.*	1953	2.3	2.1		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Compressed gas, toxic, flammable, n.o.s.*	1953	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, flammable, corrosive, n.o.s.*	3305	2.3	2.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Compressed gas, toxic, flammable, corrosive, n.o.s.*	3305	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Compressed gas, toxic, oxidizing, n.o.s.*	3303	2.3	5.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, oxidizing, n.o.s.*	3303	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Compressed gas, toxic, oxidizing, corrosive, n.o.s.*	3306	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Compressed gas, toxic, oxidizing, corrosive, n.o.s.*	3306	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ Cupric chlorate, see Copper chlorate (UN No. 2721)												
* <input checked="" type="checkbox"/> Cyanides, organic, toxic, n.o.s., see Nitriles, toxic, n.o.s.												
≠ Cyanides, organic, toxic, n.o.s., see Nitriles, liquid, toxic, n.o.s. (UN No. 3276) or Nitriles, solid, toxic, n.o.s. (UN No. 3439)												
* Cyanogen	1026	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Cyanogen	1026	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Cyanogen chloride, stabilized	1589	2.3	8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Cyanogen chloride, stabilized	1589	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Deanol, see Dimethylethanolamine												
≠ Deanol, see 2-Dimethylaminoethanol (UN No. 2051)												
* Diborane	1911	2.3	2.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Diborane	1911	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Dichlorosilane	2189	2.3	2.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Dichlorosilane	2189	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	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
<input checked="" type="checkbox"/>												
* 2-Diethylaminoethanol, see Diethylaminoethanol												
≠ Diethylaminoethanol, see 2-Diethylaminoethanol (UN 2686)												
<input checked="" type="checkbox"/>												
* Diethylcarbinol, see Amyl alcohols												
≠ Diethylcarbinol, see Pentanols (UN No. 1105)												
+ Diethylzinc, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
* Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 L
* Dimethyl disulphide	2381	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Liquid flammable			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 353 Y341	<input checked="" type="checkbox"/> 5 L 1 L	<input checked="" type="checkbox"/> 364	<input checked="" type="checkbox"/> 60 L
≠ Dimethyl disulphide	2381	3	6.1				II	E0	FORBIDDEN		FORBIDDEN	
+ Dimethylzinc, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
<input checked="" type="checkbox"/>												
* Dinitrochlorobenzenes, see Chlorodinitrobenzenes												
≠ Dinitrochlorobenzenes, see Chlorodinitrobenzenes, liquid (UN No. 1577) or Chlorodinitrobenzenes, solid (UN No. 3441)												

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
* Dinitrogen tetroxide	1067	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Dinitrogen tetroxide	1067	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ Disuccinic acid peroxide 72% or more	FORBIDDEN											
<input checked="" type="checkbox"/> * Electric storage batteries, see Batteries , etc.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
>												
* Ethylene oxide	1040	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3 US 4	A2 A131			FORBIDDEN		FORBIDDEN	
≠ Ethylene oxide	1040	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3 US 4	A2 A131			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
* Ethylene oxide and carbon dioxide mixture , with more than 87% ethylene oxide	3300	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3 US 4	A2			FORBIDDEN		FORBIDDEN	
≠ Ethylene oxide and carbon dioxide mixture , with more than 87% ethylene oxide	3300	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3 US 4	A2			FORBIDDEN		FORBIDDEN	
* Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 L
* <input checked="" type="checkbox"/> Fertilizer with ammonium nitrate, n.o.s., see Ammonium nitrate fertilizer, n.o.s.												
≠ Fertilizer with ammonium nitrate, n.o.s., see Ammonium nitrate based fertilizer (UN No. 2067) or Ammonium nitrate based fertilizers (UN No. 2071)												
* <input checked="" type="checkbox"/> Fluoric acid, see Hydrofluoric acid, solution , etc.												
≠ Fluoric acid, see Hydrofluoric acid (UN No. 1790)												

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
* Fluorine, compressed	1045	2.3	5.1 8		☑	A2			FORBIDDEN		FORBIDDEN	
					AU 1 CA 7 GB 3 IR 3 NL 1 US 3							
≠ Fluorine, compressed	1045	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ Formaldehyde solution with less than 25 per cent formaldehyde						A189						

	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
*	Gas cartridges (toxic & corrosive) without a release device, non-refillable	2037	2.3	8		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
≠	Gas cartridges (toxic & corrosive) without a release device, non-refillable	2037	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Gas cartridges (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
≠	Gas cartridges (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Gas cartridges (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
≠	Gas cartridges (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Gas cartridges (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	

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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
≠ Gas cartridges (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Gas cartridges (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Gas cartridges (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Gas cartridges (toxic) without a release device, non-refillable	2037	2.3			☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Gas cartridges (toxic) without a release device, non-refillable	2037	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Germane	2192	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Germane	2192	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
<input checked="" type="checkbox"/>												
* Heavy hydrogen, see Deuterium												
≠ Heavy hydrogen, see Deuterium, compressed (UN No. 1957)												
* Hexaethyl tetraphosphate and compressed gas mixture	1612	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hexaethyl tetraphosphate and compressed gas mixture	1612	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hexafluoroacetone	2420	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hexafluoroacetone	2420	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen bromide, anhydrous	1048	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hydrogen bromide, anhydrous	1048	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	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
*	Hydrogen chloride, anhydrous	1050	2.3	8		<div><input checked="" type="checkbox"/></div> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Hydrogen chloride, anhydrous	1050	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Hydrogen in a metal hydride storage system	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	<div><input checked="" type="checkbox"/></div> 100 kg G
≠	Hydrogen in a metal hydride storage system	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	100 kg
*	Hydrogen in a metal hydride storage system contained in equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	<div><input checked="" type="checkbox"/></div> 100 kg G
≠	Hydrogen in a metal hydride storage system contained in equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	100 kg
*	Hydrogen in a metal hydride storage system packed with equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	<div><input checked="" type="checkbox"/></div> 100 kg G
≠	Hydrogen in a metal hydride storage system packed with equipment	3468	2.1		Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1 A143 A176		E0	FORBIDDEN		214	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
* Hydrogen iodide, anhydrous	2197	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hydrogen iodide, anhydrous	2197	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen selenide, anhydrous	2202	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hydrogen selenide, anhydrous	2202	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Hydrogen sulphide	1053	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Hydrogen sulphide	1053	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Insecticide gas, n.o.s.*	1968	2.2		Gas non-flammable				E1	<input checked="" type="checkbox"/> 200 or 203 Y203	<input checked="" type="checkbox"/> 75 kg 30 kg G	<input checked="" type="checkbox"/> 200 or 203	150 kg
≠ Insecticide gas, n.o.s.*	1968	2.2		Gas non-flammable				E1	200	75 kg	200	150 kg

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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
* Insecticide gas, toxic, n.o.s.*	1967	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Insecticide gas, toxic, n.o.s.*	1967	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Insecticide gas, toxic, flammable, n.o.s.*	3355	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Insecticide gas, toxic, flammable, n.o.s.*	3355	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ Iodine monochloride, liquid	3498	8		Corrosive			II	E2	851	1.0 L	855	30 L
<input checked="" type="checkbox"/> * Iodine monochloride	1792	8		Corrosive	<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		863	50 kg
≠ Iodine monochloride, solid	1792	8		Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	FORBIDDEN		863	50 kg
<input checked="" type="checkbox"/> * Isopropyl bromide, see 2-Bromopropane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
>												

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
<input checked="" type="checkbox"/>												
* Jet tappers, without detonator, see Charges, shaped, commercial												
≠ Jet tappers, without detonator, see Charges, shaped (UN Nos. 0059, 0439, 0440, 0441)												
<input checked="" type="checkbox"/>												
* Lead (II) perchlorate, see Lead perchlorate												
≠ Lead (II) perchlorate, see Lead perchlorate, solid (UN No. 1470) or Lead perchlorate solution (UN No. 3408)												
* Liquefied gas, toxic, n.o.s.*	3162	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, n.o.s.*	3162	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Liquefied gas, toxic, corrosive, n.o.s.*	3308	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, corrosive, n.o.s.*	3308	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	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
* Liquefied gas, toxic, flammable, n.o.s.*	3160	2.3	2.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, flammable, n.o.s.*	3160	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Liquefied gas, toxic, flammable, corrosive, n.o.s.*	3309	2.3	2.1 8		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, flammable, corrosive, n.o.s.*	3309	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Liquefied gas, toxic, oxidizing, n.o.s.*	3307	2.3	5.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, oxidizing, n.o.s.*	3307	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	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
* Liquefied gas, toxic, oxidizing, corrosive, n.o.s.*	3310	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Liquefied gas, toxic, oxidizing, corrosive, n.o.s.*	3310	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ Lithium alkyls, liquid, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
+ Lithium alkyls, solid, see Organometallic substance, solid, pyrophoric, water-reactive (UN No. 3393)												
+ Lithium alloy batteries, see Lithium metal batteries , etc. (UN Nos. 3090, 3091)												
* Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	<input checked="" type="checkbox"/> A88 A99 A154 A164 A183	II	E0	965	<input checked="" type="checkbox"/> 5 kg G	965	<input checked="" type="checkbox"/> 35 kg G
≠ Lithium ion batteries (including lithium ion polymer batteries)	3480	9		Miscellaneous	US 3	A51 A88 A99 A154 A164 A183	II	E0	965	5 kg	965	35 kg

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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	II	E0	✓ see	✓ 967	✓ see	✓ 967
≠ 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 packed with equipment (including lithium ion polymer batteries)	3481	9		Miscellaneous	US 3	✓ A88 A99 A154 A164 A181	II	E0	✓ see	✓ 966	✓ see	✓ 966
≠ 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 polymer batteries, see Lithium ion batteries , etc. (UN Nos. 3480, 3481)												
* Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	II	E0	968	✓ 2.5 kg G	968	✓ 35 kg G
≠ Lithium metal batteries (including lithium alloy batteries) †	3090	9		Miscellaneous	US 2 US 3	A88 A99 A154 A164 A183	II	E0	968	2.5 kg	968	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 contained in equipment (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	✓ A48 A99 A154 A164 A181	II	E0	✓ see	✓ 970	✓ see	✓ 970
≠ 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 packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	✓ A99 A154 A164 A181	II	E0	✓ see	✓ 969	✓ see	✓ 969
≠ Lithium metal batteries packed with equipment (including lithium alloy batteries) †	3091	9		Miscellaneous	US 2 US 3	A99 A154 A181 A185	II	E0	969	5 kg	969	35 kg
+ Magnesium alkyls, see Organometallic substance, liquid, pyrophoric, water-reactive (UN No. 3394)												
* Magnesium chloride and chlorate mixture, see Chlorate and magnesium chloride mixture												
≠ Magnesium chloride and chlorate mixture, see Chlorate and magnesium chloride mixture , solid (UN No. 1459) or Chlorate and magnesium chloride mixture solution (UN No. 3407)												
+ Magnesium diphenyl, see Organometallic substance, solid, pyrophoric, water-reactive (UN No. 3393)												

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
* Mercury	2809	8	☑	☑ Corrosive	US 4		III	E0	868	35 kg	868	35 kg
≠ Mercury	2809	8	6.1	Corrosive & Toxic	US 4		III	E0	868	35 kg	868	35 kg
☑ * Mercury contained in manufactured articles	☑ 2809	8	☑	☑ Corrosive		☑ A48 A69	III	E0	869	No limit	869	No limit
≠ Mercury contained in manufactured articles	3506	8	6.1	Corrosive & Toxic		A48 A69 A192	III	E0	869	No limit	869	No limit
☑ * 1-Methoxy-2-nitrobenzene, see Nitroanisole												
≠ 1-Methoxy-2-nitrobenzene, see Nitroanisoles, liquid (UN No. 2730) or Nitroanisoles, solid (UN No. 3458)												
☑ * 1-Methoxy-3-nitrobenzene, see Nitroanisole												
≠ 1-Methoxy-3-nitrobenzene, see Nitroanisoles, liquid (UN No. 2730) or Nitroanisoles, solid (UN No. 3458)												
☑ * 1-Methoxy-4-nitrobenzene, see Nitroanisole												
≠ 1-Methoxy-4-nitrobenzene, see Nitroanisoles, liquid (UN No. 2730) or Nitroanisoles, solid (UN No. 3458)												
☑ * beta-Methyl acrolein, see Crotonaldehyde, stabilized												
≠ beta-Methyl acrolein, see Crotonaldehyde or Crotonaldehyde, stabilized (UN No. 1143)												

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
<input checked="" type="checkbox"/>												
* Methyl amyl ketone, see Amyl methyl ketone												
≠ Methyl amyl ketone, see n-Amyl methyl ketone (UN No. 1110)												
* Methyl bromide with not more than 2% chloropicrin	1062	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Methyl bromide with not more than 2% chloropicrin	1062	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Methylchlorosilane	2534	2.3	2.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Methylchlorosilane	2534	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Methyl ethyl ketone peroxide(s), more than 50%	FORBIDDEN											
≠ Methyl ethyl ketone peroxide(s), 48% or more if available oxygen above 10% and not more than 10.7% with or without water	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
* Methyl mercaptan	1064	2.3	2.1		✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Methyl mercaptan	1064	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
✓ * Methyl mercaptopropionaldehyde, see 4-Thia-pentanal												
≠ Methyl mercaptopropionaldehyde, see 4-Thiapentanal (UN No. 2785)												
✓ * Methylstyrene, inhibited, see Vinyltoluenes, inhibited												
≠ Methylstyrene, stabilized, see Vinyltoluenes, stabilized (UN No. 2618)												
* Methyltrichlorosilane	1250	3	8	Liquid flammable & Corrosive	✓ AU 1 CA 7 GB 3 IR 3 NL 1 US 3		II	✓ E2	✓ 377	✓ 1 L	377	5 L
≠ Methyltrichlorosilane	1250	3	8	Liquid flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3		II	E0	FORBIDDEN		377	5 L
✓ * Methyl vinyl benzene, inhibited, see Vinyltoluene, inhibited												
≠ Methyl vinyl benzene, stabilized, see Vinyltoluenes, stabilized (UN No. 2618)												

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
* Nitric oxide and dinitrogen tetroxide mixture	1975	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitric oxide and dinitrogen tetroxide mixture	1975	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitric oxide and nitrogen dioxide mixture	1975	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitric oxide and nitrogen dioxide mixture	1975	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitric oxide, compressed	1660	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitric oxide, compressed	1660	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Nitriles, toxic, liquid, n.o.s.*	3276	6.1		Toxic		A3 A4 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
≠ Nitriles, liquid, toxic, n.o.s.*	3276	6.1		Toxic		A3 A4 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L

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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
<input checked="" type="checkbox"/>												
* Nitriles, toxic, solid, n.o.s.*	3439	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
≠ Nitriles, solid, toxic, n.o.s.*	3439	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
* Nitrogen dioxide	1067	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitrogen dioxide	1067	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitrogen trioxide	2421	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitrogen trioxide	2421	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin	3064	3		Liquid flammable	<input checked="" type="checkbox"/> BE 3		II	E0	FORBIDDEN		371	5 L
≠ Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin	3064	3		Liquid flammable	BE 3	A188	II	E0	FORBIDDEN		371	5 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
* Nitrosyl chloride	1069	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Nitrosyl chloride	1069	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Non-activated carbon, see Carbon, animal or vegetable origin												
≠ Non-activated carbon, see Carbon (UN No. 1361)												
<input checked="" type="checkbox"/> * Non-activated charcoal, see Carbon, animal or vegetable origin												
≠ Non-activated charcoal, see Carbon (UN No. 1361)												
* Oil gas, compressed †	1071	2.3	2.1	Gas toxic & Gas flammable	<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		200	25 kg
≠ Oil gas, compressed †	1071	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	FORBIDDEN		200	25 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
<input checked="" type="checkbox"/>												
* Organometallic compound, toxic, liquid, n.o.s.*	3282	6.1		Toxic		A3 A4	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
≠ Organometallic compound, liquid, toxic, n.o.s.*	3282	6.1		Toxic		A3 A4	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
<input checked="" type="checkbox"/>												
* Organometallic compound, toxic, solid, n.o.s.*	3467	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
≠ Organometallic compound, solid, toxic, n.o.s.*	3467	6.1		Toxic		A3 A5	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
<input checked="" type="checkbox"/>												
* Organophosphorus compound, toxic, liquid, n.o.s.*	3278	6.1		Toxic		A3 A4 A6 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
≠ Organophosphorus compound, liquid, toxic, n.o.s.*	3278	6.1		Toxic		A3 A4 A6 A137	I II III	E5 E4 E1	652 654 Y641 655 Y642	1 L 5 L 1 L 60 L 2 L	658 662 663	30 L 60 L 220 L
<input checked="" type="checkbox"/>												
* Organophosphorus compound, toxic, solid, n.o.s.*	3464	6.1		Toxic		A3 A5 A6	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 kg
≠ Organophosphorus compound, solid, toxic, n.o.s.*	3464	6.1		Toxic		A3 A5 A6	I II III	E5 E4 E1	666 669 Y644 670 Y645	5 kg 25 kg 1 kg 100 kg 10 kg	673 676 677	50 kg 100 kg 200 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
<input checked="" type="checkbox"/>												
* Orthophosphoric acid, see Phosphoric acid												
≠ Orthophosphoric acid, see Phosphoric acid, solution (UN No. 1805) or Phosphoric acid, solid (UN No. 3453)												
* Oxygen difluoride, compressed	2190	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Oxygen difluoride, compressed	2190	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
+ 3-Pentanol, see Pentanois (UN No. 1105)												
* Perchloryl fluoride	3083	2.3	5.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Perchloryl fluoride	3083	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Phenylethylene, see Styrene monomer, inhibited												
≠ Phenylethylene, see Styrene monomer, stabilized (UN No. 2055)												

	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
*	Phosgene	1076	2.3	8		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
≠	Phosgene	1076	2.3	8		<div><div></div><div>AU 1 CA 7 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
*	Phosphine	2199	2.3	2.1		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
≠	Phosphine	2199	2.3	2.1		<div><div></div><div>AU 1 CA 7 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
*	Phosphorus pentafluoride	2198	2.3	8		<div><div></div><div>AU 1 CA 7 GB 3 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
≠	Phosphorus pentafluoride	2198	2.3	8		<div><div></div><div>AU 1 CA 7 IR 3 NL 1 US 3</div></div>	A2			FORBIDDEN		FORBIDDEN	
*	<div><div></div></div> Picrotoxin, see Toxins, extracted from living sources, n.o.s.												
≠	Picrotoxin, see Toxins, extracted from living sources, liquid, n.o.s. (UN No. 3172) or Toxins, extracted from living sources, solid, n.o.s. (UN No. 3462)												

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
* Polyester resin kit †	3269	3		Liquid flammable		A66 A163	II III	E0 E0		<input checked="" type="checkbox"/>		
									370	5 kg	370	5 kg
									Y370 370 Y370	1 kg 5 kg 1 kg	370	5 kg
≠ Polyester resin kit †	3269	3		Liquid flammable		A66 A163	II III	E0 E0	370	5 kg	370	5 kg
									Y370	1 kg		
									370 Y370	10 kg 5 kg	370	10 kg
<input checked="" type="checkbox"/>												
* Potassium bifluoride, see Potassium hydrogendifluoride												
≠ Potassium bifluoride, see Potassium hydrogendifluoride, solid (UN No. 1811)												


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
Receptacles, small, containing gas (toxic & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & corrosive) without a release device, non-refillable	2037	2.3	2.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
Receptacles, small, containing gas (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	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
*	Receptacles, small, containing gas (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Receptacles, small, containing gas (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Receptacles, small, containing gas (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Receptacles, small, containing gas (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*	Receptacles, small, containing gas (toxic) without a release device, non-refillable	2037	2.3			<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠	Receptacles, small, containing gas (toxic) without a release device, non-refillable	2037	2.3			AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	

Chapter 2

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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
* Selenium hexafluoride	2194	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Selenium hexafluoride	2194	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Shaped charges, see Charges, shaped, commercial												
≠ Shaped charges, see Charges, shaped (UN Nos. 0059, 0439, 0440, 0441)												
* Silicon tetrafluoride	1859	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Silicon tetrafluoride	1859	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Sodium potassium alloys, see Potassium sodium alloys												
≠ Sodium potassium alloys, see Potassium sodium alloys, liquid (UN No. 1422) or Potassium sodium alloys, solid (UN No. 3404)												

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
* Stibine	2676	2.3	2.1		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Stibine	2676	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Sulphur dioxide	1079	2.3	8		☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Sulphur dioxide	1079	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
*  Sulphuretted hydrogen, see Hydrogen sulphide, liquefied												
≠ Sulphuretted hydrogen, see Hydrogen sulphide (UN No. 1053)												
* Sulphuryl fluoride	2191	2.3			☑ AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Sulphuryl fluoride	2191	2.3			AU 1 CA 7 IR 3 NL 1 US 3	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
* Tellurium hexafluoride	2195	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Tellurium hexafluoride	2195	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Tetrafluorodichloroethane, see Dichlorotetrafluoroethane												
≠ Tetrafluorodichloroethane, see 1,2-Dichloro-1,1,2,2-tetrafluoroethane or Refrigerant gas R 114 (UN No. 1958)												
<input checked="" type="checkbox"/> * Thallium compound, n.o.s.	1707	6.1		Toxic	US 4	A6	II	E4	669 Y644	25 kg 1 kg	676	100 kg
≠ Thallium compound, n.o.s.*	1707	6.1		Toxic	US 4	A6	II	E4	669 Y644	25 kg 1 kg	676	100 kg
<input checked="" type="checkbox"/> * Toxic by inhalation liquid, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3382	6.1							FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3382	6.1							FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Toxic by inhalation liquid, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3381	6.1							FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3381	6.1							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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3389	6.1	8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3389	6.1	8						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3390	6.1	8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3390	6.1	8						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
* Toxic by inhalation liquid, corrosive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3492	6.1	3 8						FORBIDDEN		FORBIDDEN	
>												
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
* Toxic by inhalation liquid, corrosive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3493	6.1	3 8						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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3383	6.1	3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3383	6.1	3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3384	6.1	3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3384	6.1	3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3488	6.1	3 8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3488	6.1	3 8						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3489	6.1	3 8						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3489	6.1	3 8						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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, oxidizing, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3387	6.1	5.1						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, oxidizing, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3387	6.1	5.1						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, oxidizing, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3388	6.1	5.1						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, oxidizing, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3388	6.1	5.1						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3386	6.1	4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3386	6.1	4.3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3385	6.1	4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3385	6.1	4.3						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
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3490	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3490	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an inhalation toxicity lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3491	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3491	6.1	3 4.3						FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/>												
* Trichloroacetaldehyde, see Chloral, anhydrous, stabilized												
≠ Trichloroacetaldehyde, see Chloral, anhydrous, stabilized (UN No. 2075)												
<input checked="" type="checkbox"/>												
* Trichloroacetaldehyde, see Chloral, anhydrous, inhibited												
≠ Trichloroacetaldehyde, see Chloral, anhydrous, stabilized (UN No. 2075)												

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
* Trifluoroacetyl chloride	3057	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Trifluoroacetyl chloride	3057	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Trifluorochloroethylene, stabilized	1082	2.3	2.1		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Trifluorochloroethylene, stabilized	1082	2.3	2.1		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
* Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	E0	FORBIDDEN		377	5 L
* 2,4,4-Trimethylpentene-1, see Diisobutylene, isomeric compounds												
≠ 2,4,4-Trimethylpentene-1, see Diisobutylene, isomeric compounds (UN No. 2050)												
* 2,4,4-Trimethylpentene-2, see Diisobutylene, isomeric compounds												
≠ 2,4,4-Trimethylpentene-2, see Diisobutylene, isomeric compounds (UN No. 2050)												

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
* Tungsten hexafluoride	2196	2.3	8		<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
≠ Tungsten hexafluoride	2196	2.3	8		AU 1 CA 7 IR 3 NL 1 US 3	A2			FORBIDDEN		FORBIDDEN	
<input checked="" type="checkbox"/> * Villiaumite, see Sodium fluoride												
≠ Villiaumite, see Sodium fluoride, solid (UN No. 1690)												
* Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive	<input checked="" type="checkbox"/> AU 1 CA 7 GB 3 IR 3 NL 1 US 3		II	<input checked="" type="checkbox"/> E2	<input checked="" type="checkbox"/> 377	<input checked="" type="checkbox"/> 1 L	377	5 L
≠ Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3		II	E0	FORBIDDEN		377	5 L

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 2013-2014 Edition

3.1 OPERATOR APPROVAL TO CARRY DANGEROUS GOODS (DGP/23-WP/20)

3.1.1 Discussions on the need to strengthen the relationship between Annex 6 and Annex 18 had taken place at DGP-WG/10 and DGP-WG/11 (DGP/23-WP/2 (English only), paragraph 3.6.1 and DGP/23-WP/3 (English only), paragraph 3.3.5 refer). It was agreed at those meetings that a particular area which needed to be strengthened was in the area of reviews and approvals of dangerous goods operational specifications and that guidance for inclusion in the Supplement should be considered. The meeting was advised that the issue was added to the Operations Panel (OPSP) work programme by the ANC (see paragraph 6.3).

3.1.2 Guidance material related to dangerous goods certification and oversight was developed for the panel's consideration. There was strong support for the material in that it would provide much needed and useful information to States. A number of editorial amendments were addressed, mostly in relation to ensuring terminology was generic enough to apply to different Annexes and different States. It was agreed to add the revised material as a new Chapter 7 to Part S-7 of the Supplement.

3.2 STATE RESPONSIBILITIES: SHIPPER OVERSIGHT (DGP/23-WP/21)

3.2.1 The recognition of shippers as a key component in a safe supply chain was acknowledged at DGP-WG/10 and DGP-WG/11 (DGP/23-WP/2 (English only), paragraph 3.1.3 and DGP/23-WP/3 (English only), paragraph 3.1.2 refer). Difficulties for some States in implementing an audit system for shippers, due to the sheer number of shippers in their States, were also recognized. Panel members with existing shipper inspection programmes in their States were therefore asked to provide background information on tools, approaches and policies they used.

3.2.2 An approach in one State was described which included risk-based prioritization of inspections through knowledge acquired through data collected from various sources on shippers' operations. Six essential elements were listed as components in that audit system: knowledge of shippers' operations, prioritization (safety risk management), inspection activities, inspection questions, enforcement and outreach.

3.2.3 Guidance material based on that State's audit system was presented to the meeting for consideration as a new part to the Supplement on State's responsibilities in relation to shippers. There was some concern that the guidance material was based on the assumption that a State's civil aviation authority would be tasked with oversight. In some States this would not be the case. It was suggested that replacing references to inspectors with "an agent authorized by the State" would address this issue.

3.2.4 Recognizing that the material was not intended as a requirement, the panel felt it would provide much needed assistance to States, especially for those with limited resources or those developing dangerous goods programmes.

3.2.5 A revised amendment, taking comments from the panel into account, was agreed.

3.3 VOLUNTARY DISCLOSURE OF OPERATOR NON-COMPLIANCE (DGP/23-WP/22)

3.3.1 A proposal was made to remove new text in Part 7;4.6 agreed at DGP-WG/11 which required operators to report when they were in violation of certain requirements under Part 7 of the Technical Instructions. Although the intent of the original proposal was supported, it was felt that requiring operators to report on their own non-compliance could have negative implications. On the one hand, non-punitive self reporting would be important for the purpose of uncovering and addressing potential systemic failures. On the other hand, non-punitive reporting could result in the weakening of a State's prerogative for enforcement. This could have a negative impact to safety in cases where enforcement was seen to be the only effective tool for addressing negligent operators. As a remedy, it was suggested that full or partial punitive relief to an operator could be subject to the operator providing an effective corrective action plan with their incident report. The proposer reported that such a system had been successfully implemented in their State. Guidance on establishing such voluntary self-disclosure programmes by States for operators was provided to the meeting.

3.3.2 Although the panel did not agree to remove the new reporting requirement for operators, there was support for the intent of the guidance material. It was agreed that this material would be considered over the next biennium for inclusion in the Supplement to the Technical Instructions.

3.4 REVISIONS TO CLASS 1 DANGEROUS GOODS INFORMATION (DGP/23-WP/29), REVISIONS TO CLASS 2 DANGEROUS GOODS INFORMATION (DGP/23-WP/26) AND REVISIONS TO CLASSES 3 TO 9 DANGEROUS GOODS INFORMATION (DGP/23-WP/27)

3.4.1 The panel reviewed proposed amendments to Parts S-2 and S-4 of the Supplement. The amendments were based on a systematic review of how information in the dangerous goods list and the packing instructions was applied to similar substances. The structure of the parts was revised whereby goods of each class were extracted from the dangerous goods list and compiled in separate tables. Packing Instructions for each class were included after the applicable table.

3.4.2 A working group was convened to review the proposed amendments. The group reported that significant progress had been made in improving the information contained in the Supplement. Revisions to Class 1 packing instructions were basically complete. Revisions to Class 2 were fairly mature, but some outstanding issues remained. There were more outstanding issues related to Classes 3 through 9.

3.4.3 An issue which would need to be raised at the UN was discovered by the group through their review whereby many substances which were forbidden on passenger aircraft were permitted in excepted quantities in the Model Regulations. The Secretary agreed to compile these entries and prepare a report raising this issue to the next UN Sub-Committee meeting.

3.4.4 The panel expressed its appreciation to the working group, recognizing that many areas of the Supplement were outdated. A revised proposal was prepared based on comments from the panel. It was agreed that the revised amendments should be incorporated into the Supplement.

3.5 EXEMPTIONS AND APPROVALS GUIDANCE FOR STATES (DGP/23-WP/28)

3.5.1 The panel was reminded of ICAO safety oversight audit results which indicated that many States lacked an established process for processing, evaluating, and issuing exemptions and approvals in accordance with the Technical Instructions. Accordingly, guidance material was drafted by one member, and it was suggested the material be incorporated into the Supplement.

3.5.2 The material included a list of answers to frequently asked questions. It was suggested that a question and answer related to whether dangerous goods forbidden for transport under any circumstance could ever be transported should be included. This would be distinct from dangerous goods which could be transported through an approval or an exemption. This was agreed.

3.5.3 The Secretary noted that the material would be greatly appreciated by members of ICAO's Continuous Monitoring and Oversight Section, who were often asked for additional guidance from States. This information would be invaluable for States who were trying to develop dangerous goods programmes

3.5.4 The issue of whether or not the material should be included in the Supplement or simply made available on the ICAO website was discussed. The Secretary advised that since the Supplement already included guidance to States, it would be more appropriate to include the material in that document at this time.

3.5.5 The amendment, as revised, was agreed.

3.6 DRAFT AMENDMENTS TO THE SUPPLEMENT TO THE TECHNICAL INSTRUCTIONS TO ALIGN WITH THE UN RECOMMENDATIONS (DGP/23-WP/30)

3.6.1 The Meeting reviewed amendments to the Supplement to the Technical Instructions to reflect the decisions taken by the UN Committee at its fifth session (Geneva, 10 December 2010). The amendments also reflected proposals agreed by DGP-WG/10 and DGP-WG/11.

3.6.2 The amendments to the packing instructions were reviewed under DGP/23-WP/26, DGP/23-WP/27, and DGP/23-WP/29 (see paragraph 3.4).

3.6.3 References to UN packing methods in Class 1 packing instructions were outdated. These would be removed.

3.6.4 The amendments, as revised, were agreed.

3.7 **RECOMMENDATION**

3.7.1 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 9284, Supp)

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

— — — — —

APPENDIX

**PROPOSED AMENDMENTS TO THE SUPPLEMENT TO THE
TECHNICAL INSTRUCTIONS**

See paragraph 3.3.3 of DGP/23-WP/3 (English only):

Part S-1

GENERAL

**(ADDITIONAL INFORMATION
FOR PART 1 OF THE
TECHNICAL INSTRUCTIONS)**

Chapter 1

SCOPE AND APPLICABILITY

...

1.1 DESIGNATION OF NATIONAL AUTHORITY

...

1.1.2 In addition, contact information for other agencies responsible for specific classes (e.g. radioactive material, infectious substances) or for specific actions (e.g. issuance of approvals or exemptions) should be included.

Note.— For the separation of explosives, see Part S-7;2.3.

...

See paragraph 3.5 of this report:

Insert the following new Attachment:

ATTACHMENT I TO CHAPTER 1

GUIDANCE FOR PROCESSING EXEMPTIONS AND APPROVALS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR FOR INCLUSION IN THE SUPPLEMENT TO THE TECHNICAL INSTRUCTIONS

A. General Guidance

The *Technical Instructions for the Safe Transport of Dangerous Goods by Air* provide requirements to safely transport dangerous goods by air. These requirements often exceed the requirements of other modes of transport commensurate with the unique and sensitive nature of air transport.

Part 1 of the Technical Instructions provides for the issuance of approvals and exemptions in certain instances as described in 1.1.1.2. States which issue an exemption or approval should have a review process in place and exercise the appropriate technical competency to conduct a thorough evaluation and impose the necessary safety measures to ensure that the conditions of the exemption or approval issued provide an equivalent level of safety to the requirements of the Technical Instructions.

Who must obtain an exemption or approval?

The responsibility for obtaining an exemption may rest with the operator or with the shipper depending on the nature of the request and on State procedures.

When may States grant exemptions or approvals from the provisions of the Technical Instructions?

Approvals may be issued where specifically provided for in the Technical Instructions. Exemptions may be granted in cases of extreme urgency, or when other forms of transport are inappropriate, or full compliance with the prescribed requirements is contrary to public interest.

What are the responsibilities of the requestor?

It is the responsibility of the requestor to identify the specific requirements of the Technical Instructions from which relief is sought, and ensure that supporting information is provided which demonstrates that the proposed transport provisions equal or exceed the level of safety provided by the Technical Instructions.

What is an equivalent level of safety?

It is important for States to ensure that an equivalent level of safety is maintained in the issuance of any exemption or approval. An equivalent level of safety is maintained when compensating measures ensure the overall level of safety equals by that of the Technical Instructions. An equivalent level of safety evaluation will consider:

- The applicable requirements from which relief is sought;
- The compensating modifications, limitations, restrictions or equipment imposed;
- How these modifications provide an equivalent level of safety to the requirements of the Technical Instructions.

Can forbidden dangerous goods ever be transported?

Some dangerous goods designated as forbidden may be transported if certain conditions are met. The provisions of the Technical Instructions and this Supplement should be followed if there is a need to transport these substances.

Other dangerous goods cannot be carried on aircraft under any circumstance. These include articles or substances which, as presented for transport, are liable to explode, dangerously react, produce a flame or dangerous evolution of heat or dangerous emission of toxic, corrosive or flammable gases or vapours under conditions normally encountered in transport. Dangerous goods meeting this description are included in the Dangerous Goods List (Table 3-1) of the Technical Instructions with the word "Forbidden" shown in columns 2 and 3, but this list is not inclusive. It is essential that appropriate care be exercised to ensure that no goods meeting this description are offered for transport.

What packaging standards should be considered?

Where an entry in Table S-3-1 has a number in parenthesis after the word "Forbidden", this refers to a packing instruction which contains the method of packing that should be specified when issuing an exemption. As far as possible, appropriate packing instruction numbers are indicated in columns 9 to 12 of TaAzble S-3-1 and the associated detailed requirements appear in Part S-4, where these are additional to those given in the Technical Instructions.

What quantity limitations should be considered?

The suggested maximum quantity limitations to be permitted are indicated in Table S-3-2 or S-3-3 for some classes and divisions.

May an approval be granted to authorize the transport of a forbidden explosive?

Explosives transported in excess of their authorized quantities and forbidden explosives may only be transported under the provisions of an approval.

B. CONSIDERATIONS FOR EXEMPTIONS AND APPROVALS

It is recognized that competent authorities may have varying formats for issuing exemptions and approvals. The following information is suggested for consideration by States when issuing such documents:

- A synopsis the exemption or approval's scope and purpose. This should include the reason the exemption or approval is necessary.
- The authority under which the exemption or approval is issued. For an exemption, Part 1, Chapter 1, paragraph 1.1.2 should be cited. For an approval, the specific approval citation within the Technical Instructions should be listed. The issuing State's national legislation or authority may also be listed.
- A description of the dangerous goods authorized. At a minimum this information should include the UN number, proper shipping name, class, subsidiary risk, and packing group.
- Specific provisions on how the dangerous goods must be prepared for shipment under the exemption/approval authorization. These provisions should demonstrate that an equivalent level of safety has been determined.
- The conditions of transport for example authorized packaging, quantities, and any additional hazard communication elements that may apply.
- Any special conditions that may apply such as whether persons other than the grantee may re-offer the dangerous goods for subsequent transportation.
- Any limitations that may apply for example whether the approval is limited to a single instance, to a specific operator, or any other limitations that may apply.
- Whether transport by passenger and/or cargo aircraft is authorized.
- Any special reporting requirements relevant to the reporting of any incident associated with the exemption or approval.

Additional considerations for the operator must also be addressed. Safety conditions for operators to address may include:

- Restrictions on the location and of loading and unloading.
- Restrictions on the time of day of the flight to day light hours (including loading and unloading).
- Restrictions to take-off or landing only in visual meteorological conditions.
- Flight planning to avoid population dense areas.
- Restrictions on the use of hand held transmitting devices in the vicinity of the dangerous goods.
- Restrictions on the use of aircraft radios and radar during loading and unloading.
- Restrictions on the passengers onboard.
- Carriage of additional fire firefighting equipment.
- Additional segregation requirements.

The considerations above are not exhaustive. A full hazard identification and risk assessment should be conducted prior to the State's issuance of approvals and exemptions.

Part S-3. DANGEROUS GOODS LIST AND LIMITED QUANTITIES EXCEPTIONS
(additional information for Part 3 of the Technical Instructions)

See the attachments to this working paper for amendments to Table S-3-1.

...

Chapter 3

SPECIAL PROVISIONS

Table S-3-4. Special Provisions

...
TIs UN

...

See paragraph 3.2.26 of DGP/23-WP/3 (English only):

A202

For the purpose of providing life support for aquatic animals during transport, the appropriate authority of the States of Origin, of Destination and of the Operator may approve the carriage of ~~a~~ cylinders containing oxygen compressed, UN 1072 and Air, compressed UN 1002, with the valve(s) open to supply a controlled quantity of oxygen or air through a regulator into water containing the aquatic animals. The cylinder or cylinder valve must be fitted with a self-sealing device to prevent uncontrolled release of oxygen or air should the regulator malfunction or be broken or damaged. The oxygen or air cylinder must meet those parts of Packing Instruction 200 which apply, except for the need for valves to be closed. In addition, the following conditions apply as a minimum:

- a) the water container with the attached oxygen and/or air cylinder (transportation unit) must be engineered and constructed to withstand all anticipated loads. No more than two cylinders of which a maximum is one cylinder of oxygen are permitted;
- b) the water container must be tilt-tested at an angle of 45° in four directions from the upright for a 10-minute minimum duration in each direction with the oxygen supply operating, without leakage of water;
- c) the oxygen or air cylinder and regulator must be restrained and protected within the equipment;
- d) the oxygen or air regulator used must have a maximum flow rate of not more than five litres per minute;
- e) the oxygen or air flow rate to the container must be limited to that sufficient to provide life support to the aquatic animals;
- f) the quantity of oxygen or air provided must not exceed 150 per cent of the oxygen or air required for the normal duration of air transport; and
- g) only one cylinder may be carried for each 15 cubic metres of gross cargo hold volume. In no circumstances may the rate of oxygen or air flow from the cylinder exceed one litre per minute per five cubic metres of gross cargo hold volume.

See paragraph 3.6 of this report:

A218

This substance must not be transported under the provisions of Division 4.1 unless specifically authorized by the appropriate national authority (see UN 0143 or UN 0150 as appropriate).

...

TIs *UN*

A225 (358) Nitroglycerin solution in alcohol with more than 1 per cent but not more than 5 per cent nitroglycerin may be classified in Class 3 and assigned to UN 3064 provided all the requirements of Packing Instruction 371 are complied with.

...

Part S-4

PACKING INSTRUCTIONS

DGP/23 supported a proposal to group Table S-3-1 entries together by class followed by the applicable packing instructions of that class (i.e. Class 1 would be grouped together, Class 2 would be grouped together, and Classes 3 to 9 would be grouped together). For the purpose of this report, all amendments proposed to Parts 3 and 4 are presented in the same structure as the current edition of the Supplement. Subject to adoption by Council, the 2013-2014 Edition of the Supplement to Technical Instructions will be structured as agreed by DGP/23 (see paragraph 3.4 of this report).

...

Chapter 3

CLASS 1 — EXPLOSIVES

...

See paragraph 3.4 of this report:

3.2 GENERAL REQUIREMENTS

3.2.1 The general packing requirements of 4:1 of the Technical Instructions must be met.

3.2.2 All packagings for Class 1 explosives must be so designed and constructed that:

- a) they will protect the explosives, prevent them from escaping and cause no increase in the risk of unintended ignition or initiation when subjected to normal conditions of transport including foreseeable changes in temperature, humidity and pressure;
- b) the complete package can be handled safely in normal conditions of transport; and
- c) the packages will withstand any loading imposed on them by foreseeable stacking to which they will be subject during transport so that they do not add to the risk presented by the explosives, the containment function of the packagings is not harmed, and they are not distorted in a way or to an extent which will reduce their strength or cause instability of a stack.

3.2.3 All explosive substances and articles, as prepared for transport, must have been classified in accordance with the procedures detailed in 2:1.5 of the Technical Instructions.

3.3 GENERAL PACKING PROVISIONS

3.3.1 The general provisions detailed below are in addition to those in Part 4, Chapter 1 of the Technical Instructions.

3.3.1.1 The closure device of packagings containing liquid explosives must ensure a double protection against leakage.

3.3.1.2 The closure device of metal drums must include a suitable gasket; if a closure device includes a screw-thread, the ingress of explosive substances into the screw-thread must be prevented.

3.3.1.3 Packagings for water soluble substances must be water-resistant.

3.3.1.4 When the packaging includes a double envelope filled with water which may freeze during transport, a sufficient quantity of an anti-freeze agent must be added to the water to prevent freezing. Anti-freeze that could create a fire hazard because of its inherent flammability must not be used.

3.3.1.5 Nails, staples and other closure devices made of metal without protective covering must not penetrate to the inside of the outer packaging unless the inner packaging adequately protects the explosives against contact with the metal.

3.3.1.6 Inner packagings, fittings and cushioning materials and the placing of explosive substances or articles in packages must be accomplished in a manner which prevents the explosive substances or articles from becoming loose in the outer packaging under normal conditions of transport. Metallic components of articles must be prevented from making contact with metal packagings. Articles containing explosive substances not enclosed in an outer casing must be separated from each other in order to prevent friction and impact. Padding, trays, partitioning in the inner or outer packaging, mouldings or receptacles may be used for this purpose.

3.3.1.7 Packagings must be made of materials compatible with, and impermeable to, the explosives contained in the package, so that neither interaction between the explosives and the packaging materials, nor leakage, causes the explosive to become unsafe to transport, or the hazard division or compatibility group to change.

3.3.1.8 The ingress of explosive substances into the recesses of seamed metal packagings must be prevented.

3.3.1.9 Plastic packagings must not be liable to generate or accumulate sufficient static electricity so that a discharge could cause the packaged explosive substances or articles to initiate, ignite or function.

3.3.1.10 Explosive substances must not be packed in inner or outer packagings where the differences in internal and external pressures, due to thermal or other effects, could cause an explosion or rupture of the package.

3.3.1.11 Whenever loose explosive substances or the explosive substance of an uncased or partly cased article may come into contact with the inner surface of metal packagings (1A2, 1B2, 4A, 4B and metal receptacles), the metal packaging must be provided with an inner liner or coating (see 1.1.3 of the Technical Instructions).

3.3.1.12 Packing Instruction 101 may be used for any explosive provided the package has been approved by an appropriate national authority regardless of whether the packaging complies with the packing instruction assignment in the Dangerous Goods List.

3.3.1.13 Electro-explosive devices must be adequately protected against electro-magnetic radiation and stray currents.

3.3.1.14 Large and robust explosive articles, normally intended for military use, without their means of initiation or without their means of initiation containing at least two effective protective features, may be carried unpackaged. When such articles have propelling charges or are self-propelled, their ignition systems must be protected against stimuli encountered during normal conditions of transport. A negative result in Test Series 4 on an unpackaged article indicates that the article can be considered for transport unpackaged. Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling, storage or launching devices in such a way that they will not become loose during normal conditions of transport.

3.3.1.14.1 Where such large explosive articles are, as part of their operational safety and suitability tests, subjected to test regimes that meet the intentions of the Technical Instructions and such tests have been successfully undertaken, the appropriate national authority may approve such articles to be transported under the Technical Instructions.

Note 1.— The term receptacle used in the Inner and Intermediate packaging columns of this table includes boxes, bottles, cans, drums, jars and tubes, including any means of closure.

Note 2.— Reels are devices made of plastics, wood, fibreboard, metal or other suitable material comprising a central spindle with, or without, side walls at each end of the spindle. Articles and substances can be wound onto the spindle and may be retained by side walls.

Note 3.— Trays are sheets of metal, plastics, wood, fibreboard or other suitable material which are placed in the inner, intermediate or outer packaging and achieve a close-fit in such packaging. The surface of the tray may be shaped so that packagings or articles can be inserted, held secure and separated from each other.

3.2 PACKING INSTRUCTIONS

See paragraph 3.6 of this report).

110

PACKING INSTRUCTION 110

(UN packing method EP 10)

110

a) Inner packagings

Intermediate packagings

Outer packagings

Bags

plastics

textile, plastic-coated or lined

rubber

textile, rubberized

textile

Receptacles

wood

Bags

plastics

textile, plastic-coated or lined

rubber

textile, rubberized

Receptacles

metal

plastics

wood

Drums

other metal (1N1, 1N2)

plastics, removable head (1H1, 1H2)

steel, removable head (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— The intermediate packagings must be filled with water-saturated material such as an anti-freeze solution or wetted cushioning.

— Outer packagings must be filled with water-saturated material such as an anti-freeze solution or wetted cushioning.

Outer packagings must be constructed and sealed to prevent evaporation of the wetting solution, except when UN 0224 is being carried dry.

b) Inner packagings

Intermediate packagings

Outer packagings

Bags

plastics, conductive

rubber, conductive

Receptacles

metal

plastics, conductive

rubber, conductive

wood

Dividing partitions

fibreboard

metal

plastics

wood

Boxes

natural wood, with sift-proof walls (4C2)

plywood (4D)

reconstituted wood (4F)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

For UN 0074, 0113, 0114, 0129, 0130, 0135 and 0224, the following conditions must be satisfied:

a) inner packagings must not contain more than 50 g of explosive substance (quantity corresponding to dry substance);

b) compartments between dividing partitions must not contain more than one inner packaging, firmly fitted; and

c) the outer packaging must be partitioned into up to 25 compartments.

111	PACKING INSTRUCTION 111 (UN-packing method EP 11)		111
<i>Inner packagings</i>	<i>Intermediate packagings</i>	<i>Outer packagings</i>	
Bags paper, waterproofed plastics textile, rubberized <u>Receptacles</u> <u> wood</u> Sheets plastics textile, rubberized	Not necessary	Boxes aluminium (4B) expanded plastics (4H1) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with sift-proof walls (4C2) <u> other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) steel (4A) Drums aluminium, removable head (1B1, 1B2) fibreboard (1G) <u> other metal (1N1, 1N2)</u> plastics, removable head (1H1, 1H2) plywood (1D) steel, removable head (1A1, 1A2)	
PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:			
Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.20/1/Rev.17/Corr.1:			
— For UN 0159, inner packagings are not required when metal (1A1, 1A2, 1B1 , or 1B2, 1N1 or 1N2) or plastics (1H1 or 1H2) drums are used as outer packagings.			

See paragraph 3.6 of this report:

112	PACKING INSTRUCTION 112 (UN-packing method EP 12)		112
a) solid wetted 1.1D			
<i>Inner packagings</i>	<i>Intermediate packagings</i>	<i>Outer packagings</i>	
Bags paper, multiwall, water-resistant plastics textile textile, rubberized woven plastics Receptacles metal plastics <u> wood</u>	Bags plastics textile, plastic-coated or lined Receptacles metal plastics <u> wood</u>	Boxes aluminium (4B) expanded plastics (4H1) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with sift-proof walls (4C2) <u> other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) steel (4A) Drums aluminium, removable head (1B1, 1B2) fibre (1G) <u> other metal (1N)</u> plastics, removable head (1H1, 1H2) steel, removable head (1A1, 1A2)	

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0004, 0076, 0078, 0154, 0219 and 0394, packagings must be lead-free.
- Intermediate packagings are not required if leakproof drums are used as the outer packaging.
- For UN 0072 and UN 0226, intermediate packagings are not required.

b) solid dry, other than powder 1.1D

*Inner packagings**Intermediate packagings**Outer packagings*

Bags

paper, kraft
paper, multiwall, water-resistant
plastics
textile
textile, rubberized
woven plastics

Bags (for 0150 only)

plastics
textile, plastic-coated or lined

Bags

paper, multiwall, water-resistant (5M2)
plastics, film (5H4)
textile, sift-proof (5L2)
textile, water-resistant (5L3)
woven plastics, sift-proof (5H2) ~~(3)~~
woven plastics, water-resistant (5H3)

Boxes

aluminium (4B)
expanded plastics (4H1)
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, ~~removable head~~ (1B1, 1B2)
fibre (1G)
other metal (1N1, 1N2)
plastics, removable head (1H2)
steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings must be lead-free.
- For UN 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.
- For UN 0222 and UN 0223, inner packagings are not required when the outer packaging is a bag.

c) for solid dry powder 1.1D

*Inner packagings**Intermediate packagings**Outer packagings*

Bags

paper, multiwall, water-resistant
plastics
woven plastics
Receptacles
fibreboard
metal
plastics
wood

Bags (for 1050 only)

paper, multiwall, water-resistant
with inner lining
plastics
Receptacles
metal
plastics
wood

Boxes

fibreboard (4G)
other metal (4N)
natural wood, ordinary (4C1)
natural wood, with sift-proof walls (4C2)
plywood (4D)
reconstituted wood (4F)
solid plastics (4H2)
steel (4A)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
other metal (1N1, 1N2)
steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0004, 0076, 0078, 0154, 0216, 0219 and 0386, packagings must be lead-free.
- For UN 0209, bags, sift-proof (5H2) are recommended for flake or prilled TNT in the dry state and a maximum net mass of 30 kg.
- Inner packagings are not required if drums are used as the outer packaging.
- These packages must be sift-proof.

113

PACKING INSTRUCTION 113

(UN-packing-method-EP-13)

113

Inner packagings

Bags

paper

plastics

textile, rubberized

Receptacles

fibreboard

metal

plastics

wood

Sheets

paper, kraft

paper, waxed

Intermediate packagings

Not necessary

Outer packagings

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, ~~removable head~~ (1B1, 1B2)

fibre (1G)

~~other metal (1N1, 1N2)~~

steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

— For UN 0094 and UN 0305, no more than 50 g of substance must be packed in an inner packaging.

— For UN 0027, inner packagings are not necessary when drums are used as the outer packaging.

— Packages must be sift-proof.

— Sheets may only be used for UN 0028.

115

PACKING INSTRUCTION 115

(UN-packing-method-EP-15)

115

Inner packagings

Receptacles

metal

plastics

~~wood~~

Intermediate packagings

Bags

plastics in metal receptacles

Drums

metal

~~Receptacles~~

~~wood~~

Outer packagings

Boxes

fibreboard (4G)

natural wood, ordinary (4C1)

natural wood, with sift-proof walls (4C2)

~~other metal (4N)~~

plywood (4D)

reconstituted wood (4F)

Drums

aluminium, ~~removable head~~ (1B1, 1B2)

fibre (1G)

~~other metal (1N1, 1N2)~~

plywood (1D)

steel, ~~removable head~~ (1A1, 1A2)

PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:

- For UN 0075, 0143, 0495 and 0497 when boxes are used as the outer packaging, inner packagings must have taped screw cap closures and be not more than 5 litres capacity each. Inner packagings must be surrounded with non-combustible absorbent cushioning materials. The amount of absorbent cushioning material must be sufficient to absorb the liquid contents. Metal receptacles must be cushioned from each other. Net mass of propellant is limited to 30 kg for each package when outer packagings are boxes.
- For UN 0075, 0143, 0495 and 0497 when drums are used as the outer packaging and when intermediate packagings are drums, they must be surrounded with non-combustible cushioning material in a quantity sufficient to absorb the liquid contents. A composite packaging consisting of a plastic receptacle in a metal drum may be used instead of the inner and intermediate packagings. The net volume of propellant in each package must not exceed 120 litres.
- For UN 0144, absorbent cushioning material must be inserted.
- Metal receptacles as inner packagings must only be used for UN 0144.
- For UN 0075, 0143, 0495 and 0497, bags are to be used as intermediate packagings when boxes are used as outer packagings.
- For UN 0075, 0143, 0495 and 0497, drums are to be used as intermediate packagings when drums are used as outer packagings.
- For UN 0144, intermediate packagings are not necessary.
- Fibreboard boxes (4G) should only be used for UN 0144.
- For UN 0144, aluminium drums, ~~removable head~~ (1B1 and 1B2) and metal, other than steel or aluminium, drums (1N1 and 1N2), are not ~~allowed~~ permitted.

116

PACKING INSTRUCTION 116

116

(UN-packing-method EP-16)*Inner packagings**Intermediate packagings**Outer packagings***Bags**

paper, water and oil resistant
plastics
textile, plastic-coated or lined
woven plastics, sift-proof

Not necessary

Bags

paper, multiwall, water-resistant (5M2)
plastics, film (5H4)
textile, sift-proof (5L2)
textile, water-resistant (5L3)
woven plastics (5H1/2/3)

Receptacles

fibreboard, water-resistant
metal
plastics
wood, sift-proof

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)

Sheets

paper, water-resistant
paper, waxed
plastics

Drums

aluminium, ~~removable head~~ (1B1, 1B2)
fibre (1G)
other metal (1N1, 1N2)
plastics, ~~removable head~~ (1H1, 1H2)
steel, ~~removable head~~ (1A1, 1A2)
Jerricans
plastics, ~~removable head~~ (3H1, 3H2)
steel, ~~removable head~~ (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.

132	PACKING INSTRUCTION 132			132
(UN-packing-method-EP-32)				
a) Articles consisting of closed metal, plastic or fibreboard casings that contain a detonating explosive, or consisting of plastic-bonded detonating explosives				
Inner packagings	Intermediate packagings	Outer packagings		
Not necessary	Not necessary	Boxes aluminium (4B) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with sift-proof walls (4C2) <u>other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) steel (4A)		
b) Articles without closed casings				
Inner packagings	Intermediate packagings	Outer packagings		
Receptacles fibreboard metal plastics <u>wood</u> Sheets paper plastics	Not necessary	Boxes aluminium (4B) fibreboard (4G) natural wood, ordinary (4C1) natural wood, with sift-proof walls (4C2) <u>other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) steel (4A)		

144	PACKING INSTRUCTION 144			144
(UN-packing-method-EP-44)				
Inner packagings	Intermediate packagings	Outer packagings		
Receptacles fibreboard metal <u>wood</u> plastics Dividing partitions in the outer packings	Not necessary	Boxes aluminium (4B) expanded plastics (4H1) natural wood, ordinary (4C1) with metal liner <u>other metal (4N)</u> plywood (4D) with metal liner reconstituted wood (4F) with metal liner steel (4A)		
PARTICULAR PACKING REQUIREMENTS OR EXCEPTIONS:				
— For UN 0248 and UN 0249, packagings must be protected against the ingress of water. When CONTRIVANCES, WATER ACTIVATED are transported unpackaged, they must be provided with at least two independent protective features which prevent the ingress of water.				

...

Chapter 4

CLASS 2 — GASES

See paragraph 3.4 of this report:

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).

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 and ISO 11114-2:2000 must be met.

4.1.1.3 Cylinders and closed cryogenic receptacles, including their closures, must be selected that are able to contain a gas or a mixture of gases according to the requirements of 6.5.1.2 of the Technical Instructions and the requirements of the specific packing instructions of this Part.

4.1.1.4 Refillable cylinders must not be filled with a gas or gas mixture different from that previously contained unless the necessary operations for change of gas service have been performed. The change of service for compressed and liquefied gases must be in accordance with ISO 11621:1997, as applicable. In addition, a cylinder that previously contained a Class 8 corrosive substance or a substance of another class with a corrosive subsidiary risk must not be authorized for the transport of a Class 2 substance unless the necessary inspection and testing as specified in 6.5.1.6 of the Technical Instructions have been performed.

4.1.1.5 Prior to filling, the filler must perform an inspection of the cylinder or closed cryogenic receptacle and ensure that the cylinder or closed cryogenic receptacle is authorized for the gas to be transported and that the provisions of the Technical Instructions have been met. Shut-off valves must be closed after filling and remain closed during transport. The shipper must verify that the closures and equipment are not leaking.

4.1.1.6 Cylinders and closed cryogenic receptacles must be filled according to the working pressures, filling ratios and provisions specified in the appropriate packing instruction for the specific substance. Reactive gases and gas mixtures must be filled to a pressure such that if complete decomposition of the gas occurs, the working pressure of the cylinder must not be exceeded.

4.1.1.7 Cylinders and closed cryogenic receptacles, including their closures, must conform to the design, construction, inspection and testing requirements detailed in 6.5 of the Technical Instructions. When outer packagings are prescribed, the cylinders must be firmly secured therein. Unless otherwise specified in the detailed packing instructions, one or more inner packagings may be enclosed in an outer packaging.

4.1.1.8 Valves must be designed and constructed in such a way that they are inherently able to withstand damage without release of the contents or must be protected from damage, which could cause inadvertent release of the contents of the cylinder and closed cryogenic receptacle, by one of the following methods:

- a) Valves are placed inside the neck of the cylinder and closed cryogenic receptacle and protected by a threaded plug or cap;
- b) Valves are protected by caps. Caps must possess vent holes of a sufficient cross-sectional area to evacuate the gas if leakage occurs at the valves;
- c) Valves are protected by shrouds or guards;
- d) Not used; or
- e) Cylinders and closed cryogenic receptacles are transported in an outer packaging. The packaging as prepared for transport must be capable of meeting the drop test specified in 6.4.3 of the Technical Instructions at the Packing Group I performance level.

For cylinders and closed cryogenic receptacles with valves as described in b) and c), the requirements of ISO 11117:1998 must be met; for valves with inherent protection, the requirements of Annex A of ISO 10297:2006 must be met. For metal hydride storage systems, the valve protection requirements specified in ISO 16111:2008 must be met.

4.1.1.9 Non-refillable cylinders and closed cryogenic receptacles must:

- a) be transported in an outer packaging, such as a box, or crate, or in shrink-wrapped trays or stretch-wrapped trays;
- b) not used;
- c) not be repaired after being put into service.

4.1.1.10 Refillable cylinders, other than closed cryogenic receptacles, must be periodically inspected according to the provisions of 6:5.1.6 and Packing Instruction 200 or 214 of the Technical Instructions. Cylinders and closed cryogenic receptacles must not be filled after they become due for periodic inspection but may be transported after the expiry of the time limit.

4.1.1.11 Repairs must be consistent with the fabrication and testing requirements of the applicable design and construction standards and are only permitted as indicated in the relevant periodic inspection standards specified in 6:5.2.4 of the Technical Instructions. Cylinders, other than the jacket of closed cryogenic receptacles, must not be subjected to repairs of any of the following:

- a) weld cracks or other weld defects;
- b) cracks in walls;
- c) leaks or defects in the material of the wall, head or bottom.

4.1.1.12 Cylinders and closed cryogenic receptacles must not be offered for filling:

- a) when damaged to such an extent that the integrity of the cylinder and closed cryogenic receptacle or its service equipment may be affected;
- b) unless the cylinder and closed cryogenic receptacle and its service equipment have been examined and found to be in good working order; or
- c) unless the required certification, retest, and filling markings are legible.

4.1.1.13 Filled cylinders and closed cryogenic receptacles must not be offered for transport:

- a) when leaking;
- b) when damaged to such an extent that the integrity of the cylinder and closed cryogenic receptacle or its service equipment may be affected;
- c) unless the cylinder and closed cryogenic receptacle and its service equipment have been examined and found to be in good working order; or
- d) unless the required certification, retest, and filling markings are legible.

...

Packing instruction number changed to differentiate from Packing Instruction 213 in the Technical Instructions:

213 <u>0</u>	PACKING INSTRUCTION 213 <u>210</u>	213 <u>210</u>
...		

...

Chapter 5

CLASS 3 — FLAMMABLE LIQUIDS

See paragraph 3.6 of this report:

306	PACKING INSTRUCTION 306	306																					
<p>The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.</p> <p>Single packagings are not permitted.</p> <p>COMBINATION PACKAGINGS:</p> <p>...</p> <p><i>OUTER:</i></p> <table> <tr> <th><i>Boxes</i></th><th><i>Drums</i></th><th><i>Jerricans</i></th></tr> <tr> <td>fibreboard (4G)</td><td>aluminium (<u>1B1</u>, 1B2)</td><td>plastics (<u>3H1</u>, 3H2)</td></tr> <tr> <td><u>other metal (4N)</u></td><td>fibre (1G)</td><td>steel (<u>3A1</u>, 3A2)</td></tr> <tr> <td>plywood (4D)</td><td>plastics (1H2)</td><td></td></tr> <tr> <td>reconstituted wood (4F)</td><td>plywood (1D)</td><td></td></tr> <tr> <td>solid plastics (4H2)</td><td>steel (<u>1A1</u>, 1A2)</td><td></td></tr> <tr> <td>wooden (4C1, 4C2)</td><td></td><td></td></tr> </table> <p>...</p>			<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>	fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)	<u>other metal (4N)</u>	fibre (1G)	steel (<u>3A1</u> , 3A2)	plywood (4D)	plastics (1H2)		reconstituted wood (4F)	plywood (1D)		solid plastics (4H2)	steel (<u>1A1</u> , 1A2)		wooden (4C1, 4C2)		
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>																					
fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)																					
<u>other metal (4N)</u>	fibre (1G)	steel (<u>3A1</u> , 3A2)																					
plywood (4D)	plastics (1H2)																						
reconstituted wood (4F)	plywood (1D)																						
solid plastics (4H2)	steel (<u>1A1</u> , 1A2)																						
wooden (4C1, 4C2)																							

Chapter 6

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

See paragraph 3.4 of this report:

6.1 GENERAL REQUIREMENTS FOR SELF-REACTIVE SUBSTANCES

Unless otherwise provided in the Technical Instructions, the packagings used for self-reactive substances of Division 4.1 must meet Packing Group II requirements. To avoid unnecessary confinement, metal packaging meeting Packing Group I requirements must not be used.

...

See paragraph 3.6 of this report:

416	PACKING INSTRUCTION 416	416																					
<p>The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met. Single packagings are not permitted.</p> <p>COMBINATION PACKAGINGS:</p> <p>...</p> <p><i>OUTER:</i></p> <table> <tr> <td><i>Boxes</i></td><td><i>Drums</i></td><td><i>Jerricans</i></td></tr> <tr> <td>fibreboard (4G)</td><td>aluminium (<u>1B1</u>, 1B2)</td><td>plastics (<u>3H1</u>, 3H2)</td></tr> <tr> <td><u>other metal (4N)</u></td><td>fibre (1G)</td><td>steel (<u>3A1</u>, 3A2)</td></tr> <tr> <td>plywood (4D)</td><td>plastics (<u>1H1</u>, 1H2)</td><td></td></tr> <tr> <td>reconstituted wood (4F)</td><td>plywood (1D)</td><td></td></tr> <tr> <td>solid plastics (4H2)</td><td>steel (<u>1A1</u>, 1A2)</td><td></td></tr> <tr> <td>wooden (4C1, 4C2)</td><td></td><td></td></tr> </table> <p>...</p>			<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>	fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)	<u>other metal (4N)</u>	fibre (1G)	steel (<u>3A1</u> , 3A2)	plywood (4D)	plastics (<u>1H1</u> , 1H2)		reconstituted wood (4F)	plywood (1D)		solid plastics (4H2)	steel (<u>1A1</u> , 1A2)		wooden (4C1, 4C2)		
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>																					
fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)																					
<u>other metal (4N)</u>	fibre (1G)	steel (<u>3A1</u> , 3A2)																					
plywood (4D)	plastics (<u>1H1</u> , 1H2)																						
reconstituted wood (4F)	plywood (1D)																						
solid plastics (4H2)	steel (<u>1A1</u> , 1A2)																						
wooden (4C1, 4C2)																							

418	PACKING INSTRUCTION 418	418						
<p>The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.</p> <p>Single packagings are not permitted.</p> <p>COMBINATION PACKAGINGS:</p> <p>...</p> <p><i>OUTER:</i></p> <table> <tr> <th><i>Boxes</i></th><th><i>Drums</i></th><th><i>Jerricans</i></th></tr> <tr> <td> fibreboard (4G) plywood (4D) <u>other metal (4N)</u> reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2) </td><td> aluminium (<u>1B1</u>, 1B2) fibre (1G) plastics (<u>1H1</u>, 1H2) plywood (1D) steel (1A2) </td><td> plastics (<u>3H1</u>, 3H2) steel (<u>3A1</u>, 3A2) </td></tr> </table> <p>...</p>			<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>	fibreboard (4G) plywood (4D) <u>other metal (4N)</u> reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2)	aluminium (<u>1B1</u> , 1B2) fibre (1G) plastics (<u>1H1</u> , 1H2) plywood (1D) steel (1A2)	plastics (<u>3H1</u> , 3H2) steel (<u>3A1</u> , 3A2)
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>						
fibreboard (4G) plywood (4D) <u>other metal (4N)</u> reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2)	aluminium (<u>1B1</u> , 1B2) fibre (1G) plastics (<u>1H1</u> , 1H2) plywood (1D) steel (1A2)	plastics (<u>3H1</u> , 3H2) steel (<u>3A1</u> , 3A2)						

421	PACKING INSTRUCTION 421	421						
<p>The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.</p> <p>All of the following packagings must meet Packing Group II performance requirements.</p> <p>COMBINATION PACKAGINGS:</p> <p>...</p> <p><i>OUTER:</i></p> <table> <tr> <th><i>Boxes</i></th><th><i>Drums</i></th><th><i>Jerricans</i></th></tr> <tr> <td> expanded plastics (4H1) fibreboard (4G) <u>other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2) </td><td> aluminium (<u>1B1</u>, 1B2) fibre (1G) plastics (<u>1H1</u>, 1H2) plywood (1D) steel (<u>1A1</u>, 1A2) </td><td> plastics (<u>3H1</u>, 3H2) steel (<u>3A1</u>, 3A2) </td></tr> </table> <p>...</p>			<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>	expanded plastics (4H1) fibreboard (4G) <u>other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2)	aluminium (<u>1B1</u> , 1B2) fibre (1G) plastics (<u>1H1</u> , 1H2) plywood (1D) steel (<u>1A1</u> , 1A2)	plastics (<u>3H1</u> , 3H2) steel (<u>3A1</u> , 3A2)
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>						
expanded plastics (4H1) fibreboard (4G) <u>other metal (4N)</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2)	aluminium (<u>1B1</u> , 1B2) fibre (1G) plastics (<u>1H1</u> , 1H2) plywood (1D) steel (<u>1A1</u> , 1A2)	plastics (<u>3H1</u> , 3H2) steel (<u>3A1</u> , 3A2)						

422	PACKING INSTRUCTION 422	422						
<p>The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.</p> <p>All of the following packagings must meet Packing Group II performance requirements.</p> <p>Single packagings are not permitted.</p> <p>COMBINATION PACKAGINGS:</p> <p>...</p>								
<p><i>OUTER:</i></p> <table> <tr> <th><i>Boxes</i></th><th><i>Drums</i></th><th><i>Jerricans</i></th></tr> <tr> <td> fibreboard (4G) <u>other metal</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2) </td><td> aluminium (<u>1B1</u>, 1B2) fibre (1G) plywood (1D) steel (<u>1A1</u>, 1A2) </td><td> steel (<u>3A1</u>, 3A2) </td></tr> </table>			<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>	fibreboard (4G) <u>other metal</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2)	aluminium (<u>1B1</u> , 1B2) fibre (1G) plywood (1D) steel (<u>1A1</u> , 1A2)	steel (<u>3A1</u> , 3A2)
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>						
fibreboard (4G) <u>other metal</u> plywood (4D) reconstituted wood (4F) solid plastics (4H2) wooden (4C1, 4C2)	aluminium (<u>1B1</u> , 1B2) fibre (1G) plywood (1D) steel (<u>1A1</u> , 1A2)	steel (<u>3A1</u> , 3A2)						

Chapter 7

CLASS 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

See paragraph 3.4 of this report:

7.1 GENERAL REQUIREMENTS FOR ORGANIC PEROXIDES

7.1.1 Unless otherwise provided in the Technical Instructions, the packaging used for goods of Division 5.2 must meet Packing Group II requirements. To avoid unnecessary confinement, metal packaging meeting Packing Group I requirements must not be used.

7.1.2 Venting of packages is not permitted for air transport.

7.1.3 The packaging of organic peroxides presenting an explosive subsidiary risk must comply with the provisions of 4.3.2.2 and 4.3.2.3 of the Technical Instructions.

...

See paragraph 3.6 of this report:

501	PACKING INSTRUCTION 501			501																					
The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.																									
Single packagings are not permitted.																									
COMBINATION PACKAGINGS:																									
...																									
OUTER:																									
<table><tr><td>Boxes</td><td>Drums</td><td>Jerricans</td></tr><tr><td>fibreboard (4G)</td><td>aluminium (<u>1B1</u>, 1B2)</td><td>plastics (<u>3H1</u>, 3H2)</td></tr><tr><td>plywood (4D)</td><td>fibre (1G)</td><td>steel (<u>3A1</u>, 3A2)</td></tr><tr><td><u>other metal (4N)</u></td><td>plastics (<u>1H1</u>, 1H2)</td><td></td></tr><tr><td>reconstituted wood (4F)</td><td>plywood (1D)</td><td></td></tr><tr><td>solid plastics (4H2)</td><td>steel (<u>1A1</u>, 1A2)</td><td></td></tr><tr><td>wooden (4C1, 4C2)</td><td></td><td></td></tr></table>					Boxes	Drums	Jerricans	fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)	plywood (4D)	fibre (1G)	steel (<u>3A1</u> , 3A2)	<u>other metal (4N)</u>	plastics (<u>1H1</u> , 1H2)		reconstituted wood (4F)	plywood (1D)		solid plastics (4H2)	steel (<u>1A1</u> , 1A2)		wooden (4C1, 4C2)		
Boxes	Drums	Jerricans																							
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...																									

506	PACKING INSTRUCTION 506	506																					
<p>The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.</p> <p>Single packagings are not permitted.</p> <p>...</p> <p>OUTER:</p> <table> <tr> <th><i>Boxes</i></th><th><i>Drums</i></th><th><i>Jerricans</i></th></tr> <tr> <td>fibreboard (4G)</td><td>aluminium (<u>1B1</u>, 1B2)</td><td>plastics (<u>3H1</u>, 3H2)</td></tr> <tr> <td><u>other metal (4N)</u></td><td>fibre (1G)</td><td>steel (<u>3A1</u>, 3A2)</td></tr> <tr> <td>plywood (4D)</td><td>plastics (<u>1H1</u>, 1H2)</td><td></td></tr> <tr> <td>reconstituted wood (4F)</td><td>plywood (1D)</td><td></td></tr> <tr> <td>solid plastics (4H2)</td><td>steel (<u>1A1</u>, 1A2)</td><td></td></tr> <tr> <td>wooden (4C1, 4C2)</td><td></td><td></td></tr> </table> <p>...</p>			<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>	fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)	<u>other metal (4N)</u>	fibre (1G)	steel (<u>3A1</u> , 3A2)	plywood (4D)	plastics (<u>1H1</u> , 1H2)		reconstituted wood (4F)	plywood (1D)		solid plastics (4H2)	steel (<u>1A1</u> , 1A2)		wooden (4C1, 4C2)		
<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>																					
fibreboard (4G)	aluminium (<u>1B1</u> , 1B2)	plastics (<u>3H1</u> , 3H2)																					
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plywood (4D)	plastics (<u>1H1</u> , 1H2)																						
reconstituted wood (4F)	plywood (1D)																						
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...

Chapter 8

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

610	PACKING INSTRUCTION 610	610						
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614

PACKING INSTRUCTION 614

614

The general packing requirements of Part 4, Chapter 1 of the Technical Instructions must be met.

Single packagings are not permitted.

COMBINATION PACKAGINGS:

...

OUTER:

Boxes

fibreboard (4G)
other metal (4N)
 plywood (4D)
 reconstituted wood (4F)
 solid plastics (4H2)
 wooden (4C1, 4C2)

Drums

aluminium (1B1, 1B2)
 fibre (1G)
 plywood (1D)
 steel (1A1, 1A2)

Jerricans

steel (3A1, 3A2)

Chapter 10

CLASS 8 — CORROSIVES

Corrigendum to UN Model Regulations (Seventeenth revised Edition) ST/SG/AC.20/1/Rev.17/Corr.1:

807	PACKING INSTRUCTION 807			807
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...		

...

See paragraph 3.2 of this report:

Insert new Part S-5 as follows

Part S-5

STATE'S RESPONSIBILITIES

(ADDITIONAL INFORMATION FOR PART 5 OF THE TECHNICAL INSTRUCTIONS)

Chapter 1

INSPECTIONS

1.1 GUIDANCE TO STATES ON DANGEROUS GOODS INSPECTIONS

5.1.1 Annex 18 to the Chicago Convention, *The Safe Transport of Dangerous Goods by Air*, requires States, inter alia, to establish inspection procedures with a view to achieving compliance with its dangerous goods regulations. The following guidance is offered to assist in the inspection of freight forwarders and shippers. For the purposes of this guidance and to align with the terminology used in Annex 18, "inspection" should be regarded as synonymous with "audit".

5.1.2 There are a number of aspects related to the carriage of dangerous goods by air which may be the subject of inspection.

5.1.3 For purposes of guidance in this Supplement, a State inspector must include all applicable State authorities and their designated representatives.

5.2 ORGANIZATION AND PROCEDURES

5.2.1 The aim of the inspection is to assess the suitability of the organization and procedures established by freight forwarders and shippers and the facilities provided for the preparation, offering, accepting, handling and transport of dangerous goods, taking into account the nature and scale of each operation.

5.2.2 The inspection needs to confirm that there are sufficient resources for the intended operation and that individuals with specific responsibilities have been made aware of their responsibilities. It will ensure that reference manuals and regulatory guidelines are up to date and available to staff who need to use them.

5.2.3 A form suitable for this type of inspection is at Attachment I to this chapter.

5.3 CONSIGNMENT INSPECTION

5.3.1 For a shipper, inspections consist of an on-site review or examination of a shipper's processes, conducted by the State inspector, for the purpose of independently verifying compliance with applicable dangerous goods transportation regulations. The shipping area is any location where cargo and/or small packages are packaged, built-up, sorted, stored, and ready for pick-up by a freight forwarder or operator. This location may also include a location where unit load devices (ULD) are loaded by the shipper with cargo for subsequent loading onto an aircraft. The package production area includes those locations in a shipper's facility where packages are filled and receive final closing prior to being transferred to the facility's shipping department.

5.5 STAFF TRAINING

A training inspection is to confirm that all relevant staff of the freight agent or shipper have been trained, that the training has been to the required standard and given within the required periods.

5.6 TRAINING PROGRAMMES

The Technical Instructions require initial and recurrent dangerous goods training programmes be established and maintained by or on behalf of shippers of dangerous goods, including packers and persons or organizations undertaking the responsibilities of the shipper. Freight forwarders are also subject to this requirement.

5.8 RESULTS OF INSPECTIONS

The results of a dangerous goods inspection are recorded so as to produce a record of what was seen and noted at the time. The record should be sufficiently comprehensive to identify any faults or deficiencies, since these will need to be identified in a request to the freight agent or shipper to take action to remedy them. The request should include a timescale for taking remedial action.

5.9 FREQUENCY OF INSPECTIONS

The Technical Instructions do not specify the frequency of such inspections. Shipper and freight agent inspections should be conducted in accordance with State oversight programme directives. Additional inspections may occur when analysis of inspection, incident, and enforcement data develops a trend that could lead to a possible safety or compliance issue.

ATTACHMENT I TO CHAPTER 1**DANGEROUS GOODS AUDIT FORM — SHIPPER****PRE-INSPECTION RESEARCH**

Shipper Name:
 Inspection initiation date:

Office preparation: Prior to inspecting the shipper research the following:

State database: Review previous inspections associated with this shipper and record previous violation information below:

State safety risk management (SRM) database: Run “company search” or “incident summaries” for the shipper. Note any information from inspections for the same shipper from other locations beside the one you plan to inspect. Print out report and attach to this job aid for your files. Record any notable information below:

State SRM Database: Review the following additional information:

Is the shipper a holder to any exemption?

No: ☐
 Yes: ☐

If yes, record the exemption(s) and obtain copies to review and take to the inspection:

State SRM Database: Review the following additional information:

Is the shipper station a holder approvals?

No: ☐
 Yes: ☐

If yes, record the approval(s) and obtain copies to review and take to the inspection:

Other public information: Note any information from other sources on the shipper that may be helpful in conducting the inspection:

CONDUCT OF THE INSPECTION

Once at the shipper's location record the following information:

General company information:

Shipper
 Address:
 Phone number:
 Fax number:
 Company point of contact (name/title):

General company information: Business organization:

Individual: ☐
 Partnership: ☐
 Corporation: ☐
 If corporation, is this a branch or division?
 No: ☐
 Yes: ☐
 Is it a wholly-owned subsidiary?
 No: ☐
 Yes: ☐

If the corporation is a branch or division, then record the parent corporation's information here:

Corporation headquarters:

Address:

Phone number:

Fax number:

Corporate point of contact (name/title):

Shipper profile information:

Days/hours of operation:

Operators that are offered dangerous goods for air transportation from the shipper:

Shipper profile information:

List hazard class or divisions of dangerous goods offered by the shipper:

Shipper profile information:

Exemptions utilized by this shipper:

Shipper profile information:

Approvals utilized by this shipper:

Shipper profile information:

Determine if the shipper is required to have a security plan (Technical Instructions, Part 1;5):

No: ☐

Yes: ☐

If yes, what dangerous good requires the shipper to have a security plan?

Shipping area/package production area:

Observation/interview/verification:

Inspect completed dangerous goods packages awaiting pick-up for air transport by an operator for:

Transport documents

Marking

Labeling

Packaging (authorized for air transport)

Classification

Does the shipper use a checklist to ensure shipments are offered in compliance with the Technical Instructions?

No: ☐

Yes: ☐

Notes:

If packages are being prepared, then review if workers are properly closing UN Specification packaging per the package manufacturer's closing instructions. Also verify if single packagings and the inner packagings of combination packages are permitted by the Technical Instructions for the substances being shipped. (Technical Instructions, Parts 4 and 5)

Notes:

Shipping area/package production area:

Observation/interview/verification:

Record names of all workers who you observe performing dangerous goods functions to verify training records:

Notes:

Warehouse:

Observation/interview/document review/verification:

Perform a complete physical walk-through of the shipper's warehouse/storage area during the inspection. Be on the look-out for, and question the company on, any products that are marked or labelled as dangerous goods.

Notes:

Administrative office:

Interview:

Have a knowledgeable company official describe how the shipper retains dangerous goods shipping documentation. (Technical Instructions, Part 5)

- ☐ Separate dangerous goods transport document file (folder)
- ☐ Record of rejected consignments
- ☐ Electronic records (separate file or by order)
- ☐ Transport document filed with purchase/invoice order
- ☐ Transport document filed with customer file
- ☐ Transport document filed with other shipping documentation
- ☐ Test reports and instructions for packaging
- ☐ Other

Describe method utilized and note if the shipper maintains other transport documents in different locations.

Notes:

Administrative office:

Document review/verification:

Review dangerous goods transport documents on file.

Any transport documents that are in violation of the dangerous goods regulations?

No: ☐
 Yes: ☐

If yes, document for possible further investigation.

List all names of individuals who certified shipments according to the transport documents for verification of training. (Technical Instructions, Part 1):

Names:

Administrative office:

Document review/verification:

Review all transport documents that indicate that a State exemption was used by the shipper. Verify that the shipper complied with the exemptions utilized. (Technical Instructions, Part 1)

List exemptions utilized:

Review all transport documents that indicate a State approval was used by the shipper. Verify that the shipper complied with the approval. (Technical Instructions, Part 1)

List approvals utilized:

Administrative office:

Document review/verification:

Review all transport documents that indicate a security plan would be required. Verify that the shipper complied with all security plan requirements. (Technical Instructions, Part 1)

Classification of dangerous goods:

Notes:

Review all dangerous goods classifications listed on transport documents against supporting documentation that the shipper utilized to classify the material.

What is the primary method utilized by the shipper to classify their dangerous goods shipments?

- ☐ Material safety data sheet
- ☐ Product information (manufacturer)
- ☐ Lab analysis
- ☐ State approval
- ☐ Other

List:

Administrative office:

Document review/verification:

Obtain roster of all employees, agents, and contractors who perform a dangerous goods function and/or transport function for the shipper. (Technical Instructions, Parts 1 and 5)

Notes:

Obtain training records that the shipper has on file. (Technical Instructions, Parts 1 and 5):

Record the following training program information:

Name of training program:

Description of training program:

Location of training material(s):

Name and address of person providing training:

Name:

Address:

Notes:

Administrative office:

Document review/verification:

Review, verify, and compare worker rosters against training records provided by the shipper.

Compare names of workers you observed performing dangerous goods functions against shipper's training records.

Notes:

Outreach

Provide State dangerous goods outreach packet or information for the safe transport of dangerous goods by air.

Part S-7

STATE'S RESPONSIBILITIES

...

Chapter 2

STORAGE AND LOADING

...

2.2 LOADING ON PASSENGER AIRCRAFT

...

2.2.3 Where a packing group is assigned, the dangerous goods in 2.2.2 are restricted to those in Packing Group III only.

See paragraph 5.3.1 of this report:

2.2.4 For helicopter operations, the State of the Operator may approve the carriage of dangerous goods permitted for carriage on a passenger aircraft other than those in 2.2.2 and 2.2.3. When such an approval is to be granted, States should consider the factors that may mean carriage within the cabin is required or preferable such as the size/mass of packages making it impractical to carry them as an external load, accessibility to the packages and duration of the flight. When States other than the State of the Operator have notified ICAO that they require prior approval of such operations, approval must also be obtained from the States of origin and destination, as appropriate.

Renumber subsequent paragraphs accordingly

See paragraph 3.3.3 of DGP/23-WP/3:

2.3 SEPARATION OF EXPLOSIVE SUBSTANCES AND ARTICLES

Note.— The safety of explosive substances and articles would be enhanced by transporting each kind separately, but consideration of practicability and economics preclude such an ideal. In practice, a proper balance of the interest of safety against the other relevant factors necessitates a degree of mixing in the transport of explosive substances and articles of several kinds.

2.3.1 The extent to which explosives of Class 1 may be loaded together in transport is determined by the "compatibility" of the explosives. Explosives of Class 1 are considered to be compatible if they can be transported together without significantly increasing either the probability of an accident or, for a given quantity, the magnitude of the effects of such an accident.

2.3.2 Explosives in Compatibility Groups A to K and N may be transported in accordance with the following provisions:

a) packages bearing the same Compatibility Group letter may be stowed together regardless of the division number;

b) packages bearing different Compatibility Group letters must not in general be stowed together (regardless of the division number) except in the case of Compatibility Group letters C, D, E and S as explained in 2.3.3 and 2.3.4 below.

2.3.3 Explosives in Compatibility Groups C, D, E may be stowed together.

2.3.4 Explosives in Compatibility Group S may be stowed with explosives in all compatibility groups other than A and L.

2.3.5 Explosives in Compatibility Group L must not be transported with explosives in other compatibility groups. Furthermore, explosives in Compatibility Group L may only be transported with the same type of explosives within Compatibility Group L.

2.3.6 Table S-7-1 provides guidance for the separation of packages containing explosives with different compatibility groups. An "X" at the intersection of a row and column indicates that explosives of these compatibility groups must be separated. The method of separation (e.g. the minimum distance between incompatible explosives and/or

separation of incompatible explosives with other cargo) must be approved by the competent authority, taking into account the danger of transmission of detonation between the different explosives.

Table S-7-1. Separation of explosive substances and articles

<u>Compatibility group</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>J</u>	<u>K</u>	<u>L</u>	<u>N</u>	<u>S</u>
<u>A</u>		<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>
<u>B</u>	<u>x</u>		<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>C</u>	<u>x</u>	<u>x</u>				<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>D</u>	<u>x</u>	<u>x</u>				<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>E</u>	<u>x</u>	<u>x</u>				<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>F</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>		<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>G</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>		<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>H</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>		<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	
<u>J</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>		<u>x</u>	<u>x</u>	<u>x</u>	
<u>K</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>		<u>x</u>	<u>x</u>	
<u>L</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>1)</u>	<u>x</u>	<u>x</u>
<u>N</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>x</u>		
<u>S</u>	<u>x</u>										<u>x</u>		

1) see 2.3.5 above.

See paragraph 5.3.1 of this report:

2.4 CARRIAGE OF CARGO AIRCRAFT ONLY DANGEROUS GOODS BY HELICOPTERS IN THE CABIN

2.4.1 Packages bearing the "Cargo aircraft only" label may be carried in the cabin of a helicopter operating as a cargo aircraft, with the approval of the State of the Operator.

2.4.2 When granting such an approval, States should consider:

- a) the types and quantity of dangerous goods involved;
- b) the types of packaging used;
- c) the duration of the flight(s);
- d) the types of operation; and
- e) the ability to land quickly in the event of an emergency, etc.

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Chapter 4

PROVISION OF INFORMATION

4.8 INFORMATION TO THE PILOT-IN-COMMAND FOR HELICOPTER OPERATIONS

4.8.1 Part 7:4.1.1 of the Technical Instructions provides that, with the approval of State of the Operator, where circumstances make it impractical to produce written or printed information or on a dedicated form, the notification to the pilot-in-command may be abbreviated or be by other means (e.g. radio communication, as part of the working flight documentation such as a journey log or operational flight plan etc). Examples of such circumstances include:

- a) when the helicopter does not land in order to pick up the dangerous goods such that it is not possible to provide written information at that location;
- b) where the helicopter is in-flight and the planned load is changed prior to being picked up without the helicopter landing;
- c) when short, repetitive flights or a series of flights from different locations are undertaken by a helicopter where it is impractical to provide separate written information for each flight;
- d) where dangerous goods are picked up from an un-manned site.

4.8.2 When granting such an approval, States should consider all of the circumstances under which the approval is being sought, the minimum information that should be provided to the pilot-in-command and the procedures that the operator would implement to ensure that the information is provided and recorded.

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See paragraph 3.1 of this report:

Insert new Chapter 7 as follows:

Chapter 7

ANNEX 6 INFORMATION RELEVANT TO STATE'S DANGEROUS GOODS RESPONSIBILITIES

7.1 APPROVAL TO CARRY DANGEROUS GOODS AS CARGO — AIR OPERATORS

7.1.1 Annex 6 — *Operation of Aircraft, Part I — International Commercial Air Transport — Aeroplanes*, provides that operational manuals be reviewed and approved before issuing of operations specifications by the appropriate authority of the State of the Operator.

7.1.2 Part 1;4.1.2 of the Technical Instructions provides that dangerous goods training programmes be reviewed and approved by the appropriate authority of the State of the Operator.

7.1.3 Part 7;4.2 of the Technical Instructions states that an operator must provide information in the operations manual and/or other appropriate manuals as will enable flight crews and other employees to carry out their responsibilities with regard to the transport of dangerous goods.

7.1.4 Forms suitable for the review and approval of dangerous goods manuals and training programmes and for issuing operations specification are at Attachments I to III to this chapter:

Attachment I — Dangerous Goods Certification Process: This attachment outlines the process for the review and approval of dangerous goods manuals and training programmes submitted by the operator to the proper State authority for dangerous good oversight.

Attachment II — Approval Checklists: This attachment provides detailed checklists for the use of States to assist in the review and approval process for dangerous goods manuals and training programmes.

Attachment III — Operations Specifications: This attachment provides detailed information on issuing operations specifications for dangerous goods operations for operators requesting authorization to transport dangerous goods and for operators declaring their decision to not transport dangerous goods.

7.1.5 State-issued guidance and forms suitable for the review and approval of dangerous goods training programmes and manuals, as well as for issuing operations specifications, should contain the following information:

- a) Civil Aviation Administration policy addressing internal responsibilities for receiving applications for operations specifications, reviewing dangerous goods operations specifications (including coordination with dangerous goods experts), approval, and issuance of operations specifications. Policy should outline oversight, investigation, and enforcement responsibilities as related to operations specifications. Policy should also specifically address dangerous goods manual and training programme requirements.
- b) Enumeration of detailed requirements, addressing all applicable regulations and policies, to allow dangerous goods officials to ensure their review of training programmes and manuals are comprehensive and sufficient for approval. This information should be in conjunction with high-level guidance for approving officials, distinguished between operators carrying dangerous goods as cargo and operators not carrying dangerous goods as cargo.

7.2 ADDITIONAL REQUIREMENTS FOR HELICOPTER OPERATORS

7.2.1 Annex 6 — *Operation of Aircraft, Part III — International Operations — Helicopters*, provides that operational manuals be reviewed and approved before issuing of operations specifications by the appropriate authority of the State of the Operator.

7.2.2 Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, supplemental guidance and documented procedures for carriage by helicopter are required by the State of the Operator in addition to the requirements in 7.1, as compliance with full provisions of the Technical Instructions may not be practicable.

ATTACHMENT I TO CHAPTER 7

AIR OPERATOR CERTIFICATION AND APPLICATION PROCESS — GENERAL INFORMATION FOR AIR OPERATOR CERTIFICATION OF DANGEROUS GOODS TRANSPORT OPERATIONS

1. BACKGROUND

This section provides guidance concerning State operating regulations and the Technical Instructions, on dangerous goods transport. The State should ensure that operators are aware of the Technical Instructions or other dangerous goods regulations governing dangerous goods transport by air. These regulations apply to the operator's shipping and transport operations of dangerous goods. Operators should be made aware that their compliance with the dangerous goods training requirements contained in the Technical Instructions in addition to State operating regulations is mandatory. This process should be completed prior to issuing operations specifications permitting the carriage of dangerous goods. Additionally, all operators must develop and implement a system that will allow the operator to remain current with regulatory changes and updates.

Note.— Operators that choose to not carry dangerous goods as cargo must have a dangerous goods recognition programme.

2. RESPONSIBILITY FOR APPROVAL, SURVEILLANCE, AND ENFORCEMENT OF DANGEROUS GOODS PROGRAMMES

Each State has oversight responsibility for those operators they certificate to include their dangerous goods programme. The State's technical experts will evaluate operator dangerous goods manuals and training programmes for approval to ensure compliance with State operating regulations and the Technical Instructions. States will inspect operators for compliance with dangerous goods transport regulations and enforce when appropriate.

2.1 Procedures for Approval of Dangerous Goods Training

When a State receives a proposed or updated dangerous goods training programme from an operator, the State will coordinate with the appropriate dangerous goods office to evaluate the contents of the training programme. The operator will coordinate with the State as necessary to formulate a satisfactory dangerous goods training programme. Once the State determines the training to be adequate, the State may approve the dangerous goods training programme for operator implementation.

Note.— The initial approval of the training is usually done at the same time as the review and acceptance of the dangerous goods manual.

2.2 Procedures for Approval of Dangerous Goods Manuals

Consistent with State operating regulations, the dangerous goods manual is required to be submitted to the State by the operator. The State will evaluate and approve or recommend changes to ensure compliance with State regulations and the Technical Instructions. The operator should coordinate with the State as necessary to formulate a satisfactory dangerous goods manual. Once approved by the State, the operator may implement the approved operational procedures. Only the State may approve dangerous goods manuals.

3. DANGEROUS GOODS INFORMATION REQUIREMENTS FOR OPERATORS NOT ACCEPTING DANGEROUS GOODS

Operators who do not accept, handle, or store dangerous goods must provide procedures and instructions in the operator's manual as follows:

- Procedures and instructions so that all personnel responsible for accepting and handling any cargo or packaged materials receive adequate training on the recognition of items classified as dangerous goods (Adequate is defined in an operational sense to mean the demonstrated ability of required personnel to identify such items;)
- Procedures and instructions so that no packages are accepted by the operator that contain dangerous goods;
- Procedures and instructions for reporting that damaged packages found to contain, or that are suspected of containing, dangerous goods are reported in compliance with the Technical Instructions.
- Procedures and instructions to ensure that all spares and/or company material (COMAT) classified as dangerous

- goods are offered for transport by a different mode of transport (e.g. ground) and/or an operator that is authorized to transport dangerous goods; and
- Procedures and instructions to ensure that any employee, agent, or contract employee of the operator who prepares and/or offers COMAT classified as dangerous goods for shipment via any mode is fully trained as a dangerous goods shipper.

4. DANGEROUS GOODS INFORMATION REQUIREMENTS FOR OPERATORS ACCEPTING DANGEROUS GOODS

Operators who accept, handle and transport dangerous goods must provide instructions and procedures on the subjects outlined in paragraph 4.1 through 4.6 below. This information is provided as background material for the State and is not intended to supplant nor provide guidance for an operator's dangerous goods programme.

4.1 Procedures and instructions on acceptance of dangerous goods for air shipment

The operator's instructions should contain the following information:

- a) The material must be properly packaged in accordance with the packaging rules and it must be properly marked, labelled, and documented. The total quantity must be within the quantity limitations and the shipment must be accompanied by the proper shipping papers, State exemptions, or competent authority certificates, as determined by the inspection requirements for accepting shipments in the Technical Instructions, Part 7.
- b) The package may not leak or be damaged, and must be an authorized package in accordance with the applicable regulations.
- c) The package must either be authorized for carriage in passenger-carrying aircraft or labelled for cargo-only aircraft if it is not acceptable for passenger-carrying aircraft.
- d) The material must be identified by the proper shipping name, hazard class or division, identification number, and packing group (when required) in accordance with the Technical Instructions.
- e) The package must be properly marked and labelled in accordance with the Technical Instructions.
- f) Transport documents must be reviewed to ensure that all necessary information is entered, including any additional information that may be required because of the commodity shipped, or because of requirements specific to the air mode.

4.2 Storage of dangerous goods

Operators should provide specific guidance on the storage of dangerous goods. This guidance should include instructions for Class 8 (corrosive), Class 7 (radioactive), and Class 6, Division 6.1 (toxic) materials as discussed below:

- a) The storage of Class 8 (corrosive) materials next to, or in contact with, Class 4, Division 4.2 or 4.3 (flammable) solids or Class 5, Division 5.1 (oxidizing) materials must be prevented. The segregation prescribed in the Technical Instructions must be maintained for all packages containing dangerous goods that might react dangerously when stored in a position that causes or contributes to leakage.
- b) The storage of Class 7 (radioactive) materials labelled yellow II and/or yellow III will not exceed a transport index (TI) of 50 in a single storage location. These materials are stored in an area that is isolated from people and does not permit pedestrian traffic or loitering. The minimum separation distances prescribed in the Technical Instructions should be maintained between radioactive materials labelled yellow II and yellow III and packages of undeveloped film.
- c) Packages bearing a Class 6, Division 6.1 toxic label will not be stored in the same location as foodstuffs, feeds, or any edible materials intended for consumption by either humans or animals.
- d) Loading of dangerous goods. The operator should provide specific guidance for loading dangerous goods. This guidance should include:
 - 1) loading of dangerous goods in aircraft in accordance with the Technical Instructions;
 - 2) loading of radioactive materials in aircraft in accordance to ensure that limitations are in accordance with the provision of the Technical Instructions;
 - 3) loading of dangerous goods in cargo compartments or freight containers within cargo compartments in accordance with the Technical Instructions; and

- 4) a prohibition against loading packages bearing a toxic label in the same compartment that holds foodstuffs, feeds, or any edible materials intended for consumption by humans or animals unless both commodities are in separate, closed-unit load devices known as freight containers.

4.3 Written notification to pilot in command

Operators must establish procedures for notifying the pilot-in-command when dangerous goods are carried on board the aircraft in accordance with the Technical Instructions.

4.4 Reporting dangerous goods accidents and incidents

The dangerous goods information must include company procedures for reporting dangerous goods accidents and incidents, in compliance with the Technical Instructions, Part 7.

4.5 Damage to dangerous goods packages

The operator must develop procedures for handling damaged packages, radioactive contamination and substances in Class 6, Division 6.2 (infectious substances), as found in the Technical Instructions. The information should include a list of telephone numbers and addresses of organizations that can provide technical advice on clean-up techniques and precautions to minimize the possibility of injury to employees and the general public. Appropriate organizations for such advice include the following examples:

- CHEMTREC; CANUTEC
- Department of Energy;
- a State public health department;
- a State office of dangerous goods regulation; and
- centres for disease control.

4.6 Spares and/or Company Materials (COMAT)

The State should ensure that operators that use aircraft components or consumable materials (e.g. aircraft spares) classified as dangerous goods include in their manuals and provide responsible personnel training on the following information:

- Procedures and information to assist personnel (particularly maintenance, shipping, and storage personnel) to identify or recognize aircraft components and consumable materials that contain dangerous goods;
- Procedures and information on how these aircraft components or consumable materials are to be moved, stored, or handled within the facilities of the operator, or other air agency with whom they contract services to or for;
- Procedures and information for determining the proper packaging, marking, labelling, and materials compatibility, including instructions for the safe movement, storage, and handling of aircraft components and consumable materials classified as dangerous goods while they are within their facilities (including such materials as chemical oxygen generators);
- Information, guidance, and precautions on the specific hazards associated with aircraft components and consumable materials classified as dangerous goods that are to be moved, stored, or handled within their facilities.

5. EXEMPTIONS

When an operator submits a request to the State for an initial exemption, renewal or modification of their existing exemption, the State will review the application and will verify the competence and compliance history of the certificated operator in addition to ensuring compliance with State operating regulations and the Technical Instructions.

6. VIOLATIONS AND INVESTIGATIONS

When a State becomes aware of a suspected dangerous goods violation, the State shall notify the appropriate authority and ensure that inspections and investigations are conducted in accordance with State oversight programmes for dangerous goods.

7. SOURCES OF INFORMATION

The following regulations and publications pertaining to the safe transportation of dangerous goods should be made available:

7.1 National Sources

National sources of information pertaining to the safe transportation of dangerous goods should be as follows:

- State operating regulations applicable to dangerous goods operations which define the duties and responsibilities for preparing and implementing procedural manuals and training programmes dealing with the transportation of dangerous goods by air.

- the Technical Instructions
- State dangerous goods programme websites (www.state.xxx)

7.2 Technical Instructions for the Safe Transport of Dangerous Goods by Air

The Technical Instructions amplify the basic provisions of Annex 18 to the Convention on International Civil Aviation, and contain detailed instructions necessary for the safe international transport of dangerous goods by air. The Instructions are issued in a two-year edition, becoming effective on 1 January of every odd year.

Table S-7-2. Applicable Regulatory References

<i>Subjects</i>	<i>Regulatory references</i>
*‡ Dangerous goods and classifications	Technical Instructions, Part 2
‡ Transport document and certification requirements	Technical Instructions, Part 5, Chapter 4
*‡ Packaging, marking, and labeling	Technical Instructions, Part 5, Chapters 2 and 3
* Exceptions to the regulations	Technical Instructions, Part 1, Chapter 2 Technical Instructions, Part 8
Written notification to the pilot-in-command and emergency response information	Technical Instructions, Part 7, Chapter 4
* Reporting dangerous goods incidents/discrepancies	Technical Instructions, Part 7, Chapter 4
Loading, unloading, and handling	Technical Instructions, Part 7, Chapter 2
* Operators that do not accept or transport dangerous goods or dangerous goods must provide training in these subjects.	
‡ In accordance with the Technical Instructions	

ATTACHMENT II TO CHAPTER 7

DANGEROUS GOODS MANUAL AND TRAINING PROGRAMME CHECKLISTS

Dangerous Goods Operations Manuals and Training Programme Approval

Purpose:

The purpose of this document is to provide the objectives and tasks a State should conduct during the review and approval of an operator's authority to transport dangerous goods.

Scope:

A State should inspect and monitor the dangerous goods transported by the operator within its governing authority. The inspection process should verify that an operator's dangerous goods procedures and practices adhere to State operating regulations and the Technical Instructions. This includes a method of validating an operator's authority to transport dangerous goods as cargo.

The attached documents include checklists for a State to reference when reviewing an operator's dangerous goods programme. While these checklists cannot replace the necessary dangerous goods oversight experience and training of State inspector personnel, States may wish to incorporate these checklists into their oversight programmes to ensure a consistent approach to approving dangerous goods manuals and training programmes. The checklists may also be of assistance to operators developing their dangerous goods manual and training programmes.

Attachment A: Dangerous Goods Manual Approval Checklist

Attachment B: Dangerous Goods Training Programme Approval Checklist

Attachment A
Dangerous Goods Manual – Approval Checklist

Name of the operator	Certificate number:	State inspector:	
Certificate type	<input type="checkbox"/> Carrying dangerous goods as cargo <input type="checkbox"/> Not carrying dangerous goods as cargo	<input type="checkbox"/> Passenger <input type="checkbox"/> All Cargo	
Reviewed by:	Date:	Recommend approval by:	Approved <input type="checkbox"/> YES <input type="checkbox"/> NO
Objective:			
This checklist is designed to assist the State in determining if the operator's dangerous goods manual contains the information required by the governing state's authority to transport dangerous goods as cargo.			
Tasks:			
To meet the objective, the State should accomplish the following tasks:			
1. Identify the operator's representative who has overall responsibility for the dangerous goods manual.			
2. Conduct review of the dangerous goods manual.			
3. Coordinate any corrections or additions as needed with the operator's representative and applicable State inspector.			
Questions:			
To meet the objective, the State Inspector should answer the following questions:			
Does the dangerous goods manual contain procedures and information regarding acceptance? Technical Instructions 7;1.3		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	
Does the dangerous goods manual contain procedures and information regarding rejection? Technical Instructions 7;4.5		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	
Does the dangerous goods manual contain procedures and information regarding handling? Technical Instructions 7;2		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	
Does the dangerous goods manual contain procedures and information regarding storage prior to transport?		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	
Does the dangerous goods manual contain procedures and information regarding packaging of spares and company material classified as dangerous goods? Technical Instructions 1;2.2		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	
Does the dangerous goods manual contain procedures and information regarding loading? Technical Instructions 7;2.4		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	
Does the dangerous goods manual contain procedures sufficient to assist persons in identifying packages that are marked or labelled as dangerous goods? Technical Instructions 7;4.2		<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A	

Does the dangerous goods manual contain procedures sufficient to assist persons in identifying packages that may contain undeclared dangerous goods? Technical Instructions 7;5 and 7;6	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual contain procedures sufficient to assist persons in rejecting dangerous goods that do not conform to dangerous goods regulations? Technical Instructions 7;1	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual contain procedures sufficient to assist persons complying with accident and incident reporting requirements? Technical Instructions 7;4.4, 7;4.6 and 7;4.7	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual contain procedures sufficient to assist persons complying with undeclared or misdeclared reporting requirements? Technical Instructions 7;4.5 and 7;4.6	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual identify if the air carrier is authorized by the State of the operator to carry dangerous goods as cargo?	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual contain procedures for determining if packages containing dangerous goods are properly offered and accepted? Technical Instructions 7;1	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual contain procedures for determining if packages containing dangerous goods are properly handled, stored packaged, loaded and carried onboard an aircraft? Technical Instructions 7;2	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Does the dangerous goods manual contain requirements for information to the pilot-in-command? Technical Instructions 7;4.1	<input type="checkbox"/> Yes <input type="checkbox"/> No, explain <input type="checkbox"/> N/A
Additional Information:	
Does the operator conduct any excepted operations? Technical Instructions 1;1.1.5.1	<input type="checkbox"/> Yes, explain <input type="checkbox"/> No
Does the operator have any State approved exemptions or approvals?	<input type="checkbox"/> Yes, explain <input type="checkbox"/> No
Is the operator required to have a dangerous goods security plan? If so, does the dangerous goods manual contain sufficient procedures to transport high consequence dangerous goods? Technical Instructions 1;5.3 <i>Note.— If another State authority has responsibilities for operator security plans under Annex 17, approval should be coordinated prior to the authorizing of transport of high consequence dangerous goods.</i>	<input type="checkbox"/> Yes, explain <input type="checkbox"/> No

Attachment B
Dangerous Goods Training Programme — Approval Checklist

Name of the air carrier	Certification number:	State inspector:		
Certificate type:	<input type="checkbox"/> Carrying dangerous goods as cargo <input type="checkbox"/> Not Carrying dangerous goods as cargo	<input type="checkbox"/> Passenger <input type="checkbox"/> All Cargo		
Reviewed by:	Date:	Approved by:	Approved <input type="checkbox"/> YES <input type="checkbox"/> NO	
Objective:				
This checklist is designed to assist the State in determining if the operator's dangerous goods training programme contains the information required in the Technical Instructions.				
Tasks:				
To meet the objective the State should accomplish the following tasks:				
1. Identify the operator's representative that has overall responsibility for the dangerous goods training programme.				
2. Review the content of the dangerous goods training programme.				
3. Coordinate any corrections or additions as needed with the operator's representative and applicable State inspector.				
Questions:				
To meet the objective, the State should determine whether the dangerous goods training programme contains the following elements:				
General Philosophy	Applicable reference from the Technical Instructions	Yes	No	NA
1. Purpose of dangerous goods training programme	1;4, Introductory Note, 1;4.1			
2. Applicable regulatory materials	Forward;1;1, 1;2			
4. Use of the Technical Instructions	1;1.1			
6. Definitions used in air transportation of dangerous goods	1;3.1			
7. General transportation requirements	1;2			
8. Transport by aircraft	1;1.1.1			
9. Training requirements and record keeping	1;4			
10. Dangerous goods security	1;5			
Limitations	Applicable Citations	Yes	No	N/A
1. Dangerous goods forbidden on aircraft	1;2.1			
2. Exempt dangerous goods	1;1.1.5, 1;2.2, 1;2.4, 1;2.5			
4. Dangerous goods carried by passengers or crew	8;1.1			
General Requirements For Shippers	Applicable Citations	Yes	No	N/A
1. Shippers specific responsibilities and compliance to regulations	1;1.1, 1;1.2, 5;1.4			
2. Identify and recognize dangerous goods COMAT	1;4.2			
3. Specific dangerous goods COMAT exceptions	1;2.2			
List of Dangerous goods	Applicable Citations	Yes	No	N/A
1. Purpose and use of the dangerous goods table	3;2			
2. Proper shipping names	2;0.3, 3;1.2			
3. Hazard class (definition)	2;0.1			
4. UN/ID Numbers	2;0.3			
5. Packing group	2;0.2.4			
General Packing Requirements	Applicable Citations	Yes	No	N/A
1. Shippers responsibilities	5;1.4			
2. General packing requirements	5;1.1			
3. Packing instructions and assignments	4;2			
4. Excepted quantity exceptions	3;5.1			
5. Limited quantity exceptions	3;4.1			
Labeling and Marking	Applicable Citations	Yes	No	N/A
1. Markings required on packages containing dangerous goods	5;2			
2. Labels required on packages containing dangerous goods	5;3			
Dangerous goods Transport Documents and Other Relevant Documentation	Applicable Citations	Yes	No	N/A
1. Shipper's certification requirements for dangerous goods	5;4.1.6			
2. Transport document requirements	5;4, 7;4.10			
3. Description of dangerous goods required on transport	5;4.1.4, 5;4.2			

[illegible]

ATTACHMENT III TO CHAPTER 7

OPERATIONS SPECIFICATIONS

OPSPEC #xxxx — TRANSPORT OF DANGEROUS GOODS

A. Authorization

Operations specification (OpSpec) XXXX is an optional authorization applicable to operators conducting operations under State operating regulations that choose to comply with the applicable regulations to carry dangerous goods as cargo.

B. Regulatory Requirements

State operating regulations require the following:

- 1) All Operators conducting operations under State operating regulations, must indicate in their operations specification that they carry dangerous goods as cargo or do not carry dangerous goods as cargo. OpSpec XXXX is issued for those operators that carry dangerous goods. OpSpec XXXX is issued for those operators that do not carry dangerous goods as cargo and it must contain a statement to that effect.
- 2) Operators must comply with the manual requirements outlined in State operating regulations and with the dangerous goods training programme requirements in the Technical Instructions.

C. Operators that choose to carry dangerous goods as cargo

- 1) An operator conducting operations under State operating regulations that choose to carry dangerous goods as cargo (including spares and/or company materials (COMAT) classified as dangerous goods) must provide the State a general outline of the aspects of the proposed training programme as presented in Table 1-4 of the Technical Instructions. Operations manuals with the procedures and information to be used to assist personnel in the acceptance, handling, loading and transport of dangerous goods must also be submitted.
- 2) Provided the following conditions are met, the operator may be authorized to accept, handle, and transport dangerous goods.
 - a) Packages containing dangerous goods are properly offered and accepted in compliance with the Technical Instructions, Part 7, Chapter 1;
 - b) Packages containing dangerous goods are properly handled, stored, packaged, loaded, and carried onboard the operator's aircraft in compliance with the Technical Instructions, Part 7, Chapter 2;
 - c) The requirements for the notification to the pilot-in-command are as required in the Technical Instructions, Part 7, Chapter 4; and
 - d) Aircraft replacement parts, spares, consumable materials or other items regulated by the Technical Instructions are properly handled, packaged, and transported.
- 3) Additionally, for each crewmember and person performing or directly supervising a dangerous goods function involving items for transport on an aircraft, the operator's manual required by State operating regulations shall contain those procedures and information necessary to assist the crewmember or other person in identifying packages marked or labelled as containing dangerous goods or show signs of containing undeclared dangerous goods.
- 4) The manual required by State operating regulations, shall contain the operator's procedures for rejecting packages that do not conform to the dangerous goods regulations in the Technical Instructions, or that appear to contain undeclared dangerous goods.

- 5) The manual required by State operating regulations, shall contain the operator's procedures for complying with the dangerous goods accident and incident reporting requirements The Technical Instructions and the reporting of undeclared and misdeclared dangerous goods.
- 6) The operator is responsible for maintaining the records of initial and recurrent dangerous goods training within the three preceding years of all direct employees, contractors, and subcontractors directly supervising or performing an applicable dangerous goods function as described in the Technical Instructions. The training records may be electronic or paper and must be made available to the State upon request at the location the trained person performs or directly supervises the covered dangerous goods function.
- 7) Dangerous goods training records must contain the following:
 - individual's name;
 - most recent training completion date;
 - a description, copy, or reference to training material;
 - name and address of organization providing training; and
 - evidence that a test was satisfactorily completed.

D. Operators that choose to not carry dangerous goods as cargo

- 1) OpSpec XXXX will state that the operator conducting operations under State operating regulations is not authorized and shall not carry dangerous goods as cargo, satisfying the OpSpec regulatory requirement for a do not carry dangerous goods as cargo operator. The operator is prohibited from accepting, handling, or transporting dangerous goods to include spares and/or COMAT. Do Not Carry dangerous goods as cargo operators must provide to the State a general outline of the aspects of the proposed training programme as presented in Table 1-5 of the Technical Instructions.
- 2) Consistent with this prohibition, for each crewmember and person performing or directly supervising the acceptance, handling, or loading of items for transport on an aircraft, the operator's manual required by State operating regulations shall contain those procedures and information necessary to assist the crewmember or other person in identifying packages that are marked or labelled as containing dangerous goods or that show signs of containing undeclared dangerous goods.
- 3) Dangerous goods training records must contain the following:
 - individual's name;
 - most recent training completion date;
 - a description, copy, or reference to training material;
 - name and address of organization providing training; and
 - evidence that a test was satisfactorily completed.
- 4) The manual required by State operating regulations, shall contain the operator's procedures for rejecting packages offered for transport that contain dangerous goods or that appear to contain undeclared dangerous goods.

E. Issuing Operations Specifications

- 1) Upon approval of operations manuals and training programmes, the State will issue the appropriate operation's specifications to carry dangerous goods as Cargo or to not carry dangerous goods as cargo in accordance with State operating regulations.

EXTRACT FROM ANNEX 6, PART I**APPENDIX 6. AIR OPERATOR CERTIFICATE (AOC)**

(Note. — See Chapter 4, 4.2.1.5 and 4.2.1.6)

1. Purpose and scope

1.1 The AOC and its associated model specific operations specifications shall contain the minimum information required in paragraphs 2 and 3 respectively, in a standardized format.

1.2 The air operator certificate and its associated operations specifications shall define the operations for which an operator is authorized.

Note.— Attachment E, paragraph 3.2.2, contains additional information that may be listed in the operations specifications associated with the air operator certificate.

2. AOC template

Note.— Chapter 6, 6.1.2, requires a certified true copy of the AOC to be carried aboard.

AIR OPERATOR CERTIFICATE		
¹	STATE OF THE OPERATOR²	¹
	ISSUING AUTHORITY³	
AOC # ⁴ : Expiry date ⁵ :	OPERATOR NAME⁶ Dba trading name ⁷ : Operator address ⁸ : Telephone ⁹ : Fax: E-mail:	OPERATIONAL POINTS OF CONTACT¹⁰ Contact details, at which operational management can be contacted without undue delay, are listed in _____ ¹¹ .
This certificate certifies that _____ ¹² is authorized to perform commercial air operations, as defined in the attached operations specifications, in accordance with the operations manual and the _____ ¹³ .		
Date of issue ¹⁴ :	Name and signature ¹⁵ : Title:	

Notes.—

1. For use of the State of the Operator.
2. Replace by the name of the State of the Operator.
3. Replace by the identification of the issuing authority of the State of the Operator.
4. Unique AOC number, as issued by the State of the Operator.
5. Date after which the AOC ceases to be valid (dd-mm-yyyy).
6. Replace by the operator's registered name.
7. Operator's trading name, if different. Insert "dba" before the trading name (for "doing business as").
8. Operator's principal place of business address.
9. Operator's principal place of business telephone and fax details, including the country code. E-mail to be provided if available.

10. The contact details include the telephone and fax numbers, including the country code, and the e-mail address (if available) at which operational management can be contacted without undue delay for issues related to flight operations, airworthiness, flight and cabin crew competency, dangerous goods and other matters, as appropriate.
11. Insert the controlled document, carried on board, in which the contact details are listed, with the appropriate paragraph or page reference, e.g.: "Contact details are listed in the operations manual, Gen/Basic, Chapter 1, 1.1" or "... are listed in the operations specifications, page 1" or "... are listed in an attachment to this document".
12. Operator's registered name.
13. Insertion of reference to the appropriate civil aviation regulations.
14. Issuance date of the AOC (dd-mm-yyyy).
15. Title, name and signature of the authority representative. In addition, an official stamp may be applied on the AOC.

3. Operations specifications for each aircraft model

Note.— Chapter 6, 6.1.2, requires a copy of the operations specifications of this section to be carried aboard.

3.1 For each aircraft model in the operator's fleet, identified by aircraft make, model and series, the following list of authorizations, conditions and limitations shall be included: issuing authority contact details, operator name and AOC number, date of issue and signature of the authority representative, aircraft model, types and area of operations, special limitations and authorizations.

Note.— If authorizations and limitations are identical for two or more models, these models may be grouped in a single list.

3.2 The operations specifications layout referred to in Chapter 4, 4.2.1.6, shall be as follows:

Note.— The MEL constitutes an integral part of the operations manual.

OPERATIONS SPECIFICATIONS (subject to the approved conditions in the operations manual)				
ISSUING AUTHORITY CONTACT DETAILS¹				
Telephone: _____		Fax: _____		E-mail: _____
AOC# ² : _____		Operator name ³ : _____		Date ⁴ : _____ Signature: _____
Dba trading name: _____				
Aircraft model ⁵ : _____				
Types of operation: Commercial air transportation <input type="checkbox"/> Passengers <input type="checkbox"/> Cargo <input type="checkbox"/> Other ⁶ : _____				
Area(s) of operation ⁷ : _____				
Special limitations ⁸ : _____				
SPECIAL AUTHORIZATIONS	YES	NO	SPECIFIC APPROVALS ⁹	REMARKS
Dangerous goods	<input type="checkbox"/>	<input type="checkbox"/>		
Low visibility operations				
Approach and landing	<input type="checkbox"/>	<input type="checkbox"/>	CAT ¹⁰ : _____ RVR: _____ m DH: _____ ft	
Take-off	<input type="checkbox"/>	<input type="checkbox"/>	RVR ¹¹ : _____ m	
RVSM ¹² <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>		
ETOPS ¹³ <input type="checkbox"/> N/A	<input type="checkbox"/>	<input type="checkbox"/>	Maximum diversion time ¹⁴ : _____ minutes	
Navigation specifications for PBN operations ¹⁵	<input type="checkbox"/>	<input type="checkbox"/>		16
Continuing airworthiness	<div style="border: 1px solid black; width: 20px; height: 20px; transform: rotate(45deg); margin: 0 auto;"></div>	<div style="border: 1px solid black; width: 20px; height: 20px; transform: rotate(45deg); margin: 0 auto;"></div>	17	
Other ¹⁸	<input type="checkbox"/>	<input type="checkbox"/>		

Notes.—

1. Telephone and fax contact details of the authority, including the country code. E-mail to be provided if available.
2. Insert the associated AOC number.
3. Insert the operator's registered name and the operator's trading name, if different. Insert "dba" before the trading name (for "doing business as").
4. Issuance date of the operations specifications (dd-mm-yyyy) and signature of the authority representative.

5. *Insert the Commercial Aviation Safety Team (CAST)/ICAO designation of the aircraft make, model and series, or master series, if a series has been designated (e.g. Boeing-737-3K2 or Boeing-777-232). The CAST/ICAO taxonomy is available at: <http://www.intlaviationstandards.org/>.*
6. *Other type of transportation to be specified (e.g. emergency medical service).*
7. *List the geographical area(s) of authorized operation (by geographical coordinates or specific routes, flight information region or national or regional boundaries).*
8. *List the applicable special limitations (e.g. VFR only, day only).*
9. *List in this column the most permissive criteria for each approval or the approval type (with appropriate criteria).*
10. *Insert the applicable precision approach category (CAT I, II, IIIA, IIIB or IIIC). Insert the minimum RVR in metres and decision height in feet. One line is used per listed approach category.*
11. *Insert the approved minimum take-off RVR in metres. One line per approval may be used if different approvals are granted.*
12. *“Not applicable (N/A)” box may be checked only if the aircraft maximum ceiling is below FL 290.*
13. *Extended range operations (ETOPS) currently applies only to twin-engined aircraft. Therefore the “Not applicable (N/A)” box may be checked if the aircraft model has more than 2 engines. Should the concept be extended to 3 or 4-engined aircraft in the future, the “Yes” or “No” checkbox will be required to be checked.*
14. *The threshold distance may also be listed (in NM), as well as the engine type.*
15. *Performance-based navigation (PBN): one line is used for each PBN specification authorization (e.g. RNAV 10, RNAV 1, RNP 4), with appropriate limitations or conditions listed in the “Specific Approvals” and/or “Remarks” columns.*
16. *Limitations, conditions and regulatory basis for operational approval associated with the performance-based navigation specifications (e.g. GNSS, DME/DME/IRU). Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in the Performance-based Navigation (PBN) Manual (Doc 9613).*
17. *Insert the name of the person/organization responsible for ensuring that the continuing airworthiness of the aircraft is maintained and the regulation that requires the work, i.e. within the AOC regulation or a specific approval (e.g. EC2042/2003, Part M, Subpart G).*
18. *Other authorizations or data can be entered here, using one line (or one multi-line block) per authorization (e.g. special approach authorization, MNPS, approved navigation performance).*

— — — — —

ATTACHMENT A
PROPOSED AMENDMENTS TO TABLE S-3-1

DGP/23 supported a proposal to group Table S-3-1 entries together by class followed by the applicable packing instructions of that class (i.e. Class 1 would be grouped together, Class 2 would be grouped together, and Classes 3 to 9 would be grouped together). For the purpose of this report, all amendments proposed to Parts 3 and 4 are presented in the same structure as the current edition of the Supplement. Subject to adoption by Council, the 2013-2014 Edition of the Supplement to Technical Instructions will be structured as agreed by DGP/23 (see paragraph 3.4 of this report).

Table S-3-1. Supplementary Dangerous Goods List - DRAFT

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
A												
≠ Ammonia, anhydrous	1005	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
≠ Ammonia solution, relative density less than 0.880 at 15°C in water, with more than 50% ammonia	3318	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
≠ Arsine	2188	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
B												
≠ Boron trichloride	1741	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
≠ Boron trifluoride	1008	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2 A191			See 210		See 210	
≠ Bromine chloride	2901	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
C												
≠ Carbon monoxide, compressed	1016	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	

Chapter 2

S-3-2-1

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
⚠ Carbonyl fluoride	2417	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Carbonyl sulphide	2204	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
+ Chemical under pressure, corrosive, n.o.s.*	3503	2.2	8	Gas non-flammable & Corrosive		A1 A187		E0	FORBIDDEN		218	100 kg
+ Chemical under pressure, flammable, n.o.s.*	3501	2.1		Gas flammable		A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, flammable, corrosive, n.o.s.*	3505	2.1	8	Gas flammable & Corrosive		A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, flammable, toxic, n.o.s.*	3504	2.1	6.1	Gas flammable & Toxic		A1 A187		E0	FORBIDDEN		218	75 kg
+ Chemical under pressure, toxic, n.o.s.*	3502	2.2	6.1	Gas non-flammable & Toxic		A1 A187		E0	FORBIDDEN		218	100 kg
⚠ Chlorine	1017	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Chlorine pentafluoride	2548	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Chlorine trifluoride	1749	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Chloropicrin and methyl bromide mixture with more than 2% chloropicrin	1581	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210

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
≠ Chloropicrin and methyl chloride mixture	1582	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	E0	377	1 L	377	5 L
≠ Chlorosilanes, toxic, corrosive, n.o.s.*	3361	6.1	8	Toxic & Corrosive			II	E0	681	1 L	681	30 L
≠ Chlorosilanes, toxic, corrosive, flammable, n.o.s.*	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	E0	681	1 L	681	30 L
≠ Coal gas, compressed †	1023	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Compressed gas, toxic, n.o.s.*	1955	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Compressed gas, toxic, corrosive, n.o.s.*	3304	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Compressed gas, toxic, flammable, n.o.s.*	1953	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Compressed gas, toxic, flammable, corrosive, n.o.s.*	3305	2.3	2.1 8	Gas toxic & Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Compressed gas, toxic, oxidizing, n.o.s.*	3303	2.3	5.1	Gas toxic & Oxidizer	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210

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
⚠ Compressed gas, toxic, oxidizing, corrosive, n.o.s.*	3306	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Cyanogen	1026	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Cyanogen chloride, stabilized	1589	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
D												
⚠ Diborane	1911	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Dichlorosilane	2189	2.3	2.1 8	Gas toxic & Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	E0	377	1 L	377	5 L
⚠ Dimethyl disulphide	2381	3	6.1	Liquid flammable & Toxic		A223	II	E0	353	5 L	364	60 L
⚠ Dinitrogen tetroxide	1067	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
E												
⚠ Ethylene oxide	1040	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3 US 4	A2 A131			See	210	See	210

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
≠ Ethylene oxide and carbon dioxide mixture, with more than 87% ethylene oxide	3300	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3 US 4	A2			See	210	See	210
≠ Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	E0	377	1 L	377	5 L
F												
≠ Fluorine, compressed	1045	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
G												
≠ Gas cartridges (toxic & corrosive) without a release device, non-refillable	2037	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Gas cartridges (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	2.1 8	Gas toxic & Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Gas cartridges (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Gas cartridges (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Gas cartridges (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1	Gas toxic & Oxidizer	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210

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
⚡ Gas cartridges (toxic) without a release device, non-refillable	2037	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚡ Germane	2192	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
H												
⚡ Hexaethyl tetraphosphate and compressed gas mixture	1612	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚡ Hexafluoroacetone	2420	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚡ Hydrogen bromide, anhydrous	1048	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚡ Hydrogen chloride, anhydrous	1050	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚡ Hydrogen in a metal hydride storage system	3468	2.1		Gas flammable		A1 A143 A176		E0	FORBIDDEN		214	100 kg
⚡ Hydrogen in a metal hydride storage system contained in equipment	3468	2.1		Gas flammable		A1 A143 A176		E0	FORBIDDEN		214	100 kg
⚡ Hydrogen in a metal hydride storage system packed with equipment	3468	2.1		Gas flammable		A1 A143 A176		E0	FORBIDDEN		214	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
⚠ Hydrogen iodide, anhydrous	2197	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Hydrogen selenide, anhydrous	2202	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Hydrogen sulphide	1053	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
I												
⚠ Insecticide gas, toxic, n.o.s.*	1967	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Insecticide gas, toxic, flammable, n.o.s.*	3355	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Iodine monochloride, solid	1792	8		Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A1	II	E0	815	(15 kg)	863	50 kg
L												
⚠ Liquefied gas, toxic, n.o.s.*	3162	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Liquefied gas, toxic, corrosive, n.o.s.*	3308	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210

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
≠ Liquefied gas, toxic, flammable, n.o.s.*	3160	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Liquefied gas, toxic, flammable, corrosive, n.o.s.*	3309	2.3	2.1 8	Gas toxic & Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Liquefied gas, toxic, oxidizing, n.o.s.*	3307	2.3	5.1	Gas toxic & Oxidizer	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Liquefied gas, toxic, oxidizing, corrosive, n.o.s.*	3310	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
M												
≠ Methyl bromide with not more than 2% chloropicrin	1062	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	207	(25 kg)
≠ Methylchlorosilane	2534	2.3	2.1 8	Gas toxic & Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Methyl mercaptan	1064	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
≠ Methyltrichlorosilane	1250	3	8	Liquid flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3		II	E0	377	1 L	377	5 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
N												
⚠ Nitric oxide and dinitrogen tetroxide mixture	1975	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Nitric oxide and nitrogen dioxide mixture	1975	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Nitric oxide, compressed	1660	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Nitrogen dioxide	1067	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Nitrogen trioxide	2421	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Nitroglycerin solution in alcohol with more than 1% but not more than 5% nitroglycerin	3064	3		Liquid flammable	BE 3	A188	II	E0	FORBIDDEN		371	5 L
⚠ Nitrosyl chloride	1069	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
O												
⚠ Oil gas, compressed †	1071	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A1		E0	See	210	200	25 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
P	⚠ Oxygen difluoride, compressed	2190	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
	⚠ Perchloryl fluoride	3083	2.3	5.1	Gas toxic & Oxidizer	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
	⚠ Phosgene	1076	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
	⚠ Phosphine	2199	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
	⚠ Phosphorus pentafluoride	2198	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
R	⚠ Receptacles, small, containing gas (toxic & corrosive) without a release device, non-refillable	2037	2.3	2.1 8	Gas toxic & Gas flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
	⚠ Receptacles, small, containing gas (toxic, flammable & corrosive) without a release device, non-refillable	2037	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	
	⚠ Receptacles, small, containing gas (toxic & flammable) without a release device, non-refillable	2037	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210	See 210	

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
⚠ Receptacles, small, containing gas (toxic, oxidizing & corrosive) without a release device, non-refillable	2037	2.3	5.1 8	Gas toxic & Oxidizer & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Receptacles, small, containing gas (toxic & oxidizing) without a release device, non-refillable	2037	2.3	5.1	Gas toxic & Oxidizer	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Receptacles, small, containing gas (toxic) without a release device, non-refillable	2037	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
S												
⚠ Selenium hexafluoride	2194	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Silicon tetrafluoride	1859	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Stibine	2676	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Sulphur dioxide	1079	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210
⚠ Sulphuryl fluoride	2191	2.3		Gas toxic	AU 1 CA 7 IR 3 NL 1 US 3	A2			See	210	See	210

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
T												
≠ Tellurium hexafluoride	2195	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
≠ Toxic by inhalation liquid, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3382	6.1		Toxic			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3381	6.1		Toxic			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3389	6.1	8	Toxic & Corrosive			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3390	6.1	8	Toxic & Corrosive			I		FORBIDDEN		FORBIDDEN	
>												
>												
≠ Toxic by inhalation liquid, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3383	6.1	3	Toxic & Liquid flammable			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3384	6.1	3	Toxic & Liquid flammable			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3488	6.1	3 8	Toxic & Liquid flammable & Corrosive					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
≠ Toxic by inhalation liquid, flammable, corrosive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3489	6.1	3 8	Toxic & Liquid flammable & Corrosive					FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, oxidizing, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3387	6.1	5.1	Toxic & Oxidizer			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, oxidizing, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3388	6.1	5.1	Toxic & Oxidizer			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3386	6.1	4.3	Toxic & Danger if wet			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3385	6.1	4.3	Toxic & Danger if wet			I		FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 200 ml/m ³ and saturated vapour concentration greater than or equal to 500 LC ₅₀	3490	6.1	3 4.3	Toxic & Liquid flammable & Danger if wet					FORBIDDEN		FORBIDDEN	
≠ Toxic by inhalation liquid, water-reactive, flammable, n.o.s.* with an LC ₅₀ lower than or equal to 1 000 ml/m ³ and saturated vapour concentration greater than or equal to 10 LC ₅₀	3491	6.1	3 4.3	Toxic & Liquid flammable & Danger if wet					FORBIDDEN		FORBIDDEN	
≠ Trifluoroacetyl chloride	3057	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
≠ Trifluorochloroethylene, stabilized	1082	2.3	2.1	Gas toxic & Gas flammable	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	

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
≠ Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	E0	377	1 L	377	5 L
≠ Tungsten hexafluoride	2196	2.3	8	Gas toxic & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3	A2			See 210		See 210	
V												
≠ Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive	AU 1 CA 7 IR 3 NL 1 US 3		II	E0	377	1 L	377	5 L

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 2013-2014 Edition

4.1 DRAFT AMENDMENTS TO THE EMERGENCY RESPONSE GUIDANCE FOR AIRCRAFT INCIDENTS INVOLVING DANGEROUS GOODS (DGP/23-WP/78)

4.1.1 The Meeting reviewed amendments to the Emergency Response Guidance to reflect proposals agreed by DGP-WG/10 and DGP-WG/11.

4.1.2 An amendment to include a new drill letter to Table 4-1 applicable to incidents involving lithium batteries was agreed at that meeting. The new drill letter “Z” would recommend the use of water as a fire-fighting agent involving lithium batteries and that the crew consider landing immediately. There were some concerns at DGP-WG/11 that referring to the use of water would imply that a water extinguisher must be carried. It was explained, however, this would not be the case; water was needed as a cooling agent, not necessarily as a fire extinguisher.

4.1.3 The amendments were agreed.

4.2 RECOMMENDATION

4.2.1 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 1

GENERAL INFORMATION

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1.5 ACCESSIBILITY OF DANGEROUS GOODS

Dangerous goods bearing the “cargo aircraft only” label are required to be accessible in flight, except for:

See paragraph 3.4.2 of DGP/23-WP/3:

~~1) flammable liquids (Class 3) of Packing Group III, without subsidiary risks;~~

See paragraph 2.8.9 of this report (the amendments proposed in paragraph 2.8.9 are to Part 7;2.4.1.2 of the Technical Instructions. The Secretariat replicated those amendments here as this paragraph mirrors the provisions in 7;2.4.1.2 of the Technical Instructions):

1) flammable liquids (Class 3), Packing Group III, other than those with a subsidiary risk of Class 8;

2) toxic ~~and infectious~~ substances (~~Class~~ Division 6.1) with no subsidiary risk other than Class 3;

3) infectious substances (Division 6.2);

~~34~~ radioactive materials (Class 7); and

~~45~~ miscellaneous dangerous goods (Class 9).

Other dangerous goods (those which do not bear “cargo aircraft only” labels) are not required to be accessible.

Part 7, Chapter 2 of the Technical Instructions sets out the full requirements on the accessibility of dangerous goods on cargo aircraft.

...

Table 4-1. Aircraft Emergency Response Drills						
1. COMPLETE APPROPRIATE AIRCRAFT EMERGENCY PROCEDURES. 2. CONSIDER LANDING AS SOON AS PRACTICABLE. 3. USE DRILL FROM THE CHART BELOW.						
DRILL NO.	INHERENT RISK	RISK TO AIRCRAFT	RISK TO OCCUPANTS	SPILL OR LEAK PROCEDURE	FIREFIGHTING PROCEDURE	ADDITIONAL CONSIDERATIONS
...						
6	Toxic* may be fatal if inhaled, ingested, or absorbed by skin	Contamination with toxic liquid or solid				
...						
9	No general inherent risk	As indicated by the drill letter	As indicated by the drill letter	Use 100% oxygen; establish and maintain maximum ventilation if "A" drill letter	All agents according to availability; <u>Use water if available on "Z" drill letter</u> no water on "W" drill letter	None <u>If "Z" drill letter, consider landing immediately.</u>
DRILL LETTER	ADDITIONAL RISK	DRILL LETTER	ADDITIONAL RISK			
A	ANAESTHETIC	N	NOXIOUS			
C	CORROSIVE	P	TOXIC* (POISON)			
E	EXPLOSIVE	S	SPONTANEOUSLY COMBUSTIBLE OR PYROPHORIC			
F	FLAMMABLE	W	IF WET GIVES OFF <u>POISONOUS</u> <u>TOXIC*</u> OR FLAMMABLE GAS			
H	HIGHLY IGNITABLE	X	OXIDIZER			
i	IRRITANT / TEAR PRODUCING	Y	DEPENDING ON THE TYPE OF INFECTIOUS SUBSTANCE, THE APPROPRIATE NATIONAL AUTHORITY MAY BE REQUIRED TO QUARANTINE INDIVIDUALS, ANIMALS, CARGO AND THE AIRCRAFT			
L	OTHER RISK LOW OR NONE					
M	MAGNETIC					
		<u>Z</u>	<u>AIRCRAFT CARGO FIRE SUPPRESSION SYSTEM MAY NOT EXTINGUISH OR CONTAIN THE FIRE. CONSIDER LANDING IMMEDIATELY.</u>			

* Toxic has the same meaning as poison.

Amend Tables 4-2 and 4-3 as indicated:

<i>UN No.</i>	<i>Drill Code</i>	<i>Proper shipping name</i>
3480	9F 9FZ	Lithium ion batteries
3481	9F 9FZ	Lithium ion batteries contained in equipment
3481	9F 9FZ	Lithium ion batteries packed with equipment
3090	9F 9FZ	Lithium metal batteries
3091	9F 9FZ	Lithium metal batteries contained in equipment
3091	9F 9FZ	Lithium metal batteries packed with equipment
<u>3500</u>	<u>2L</u>	<u>Chemical under pressure, n.o.s.*</u>
<u>3501</u>	<u>10L</u>	<u>Chemical under pressure, flammable, n.o.s.*</u>
<u>3502</u>	<u>2P</u>	<u>Chemical under pressure, toxic, n.o.s.*</u>
<u>3503</u>	<u>2C</u>	<u>Chemical under pressure, corrosive, n.o.s.*</u>
<u>3504</u>	<u>10P</u>	<u>Chemical under pressure, flammable, toxic, n.o.s.*</u>
<u>3505</u>	<u>10C</u>	<u>Chemical under pressure, flammable, corrosive, n.o.s.*</u>

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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 AGENDA ITEM 5.1: REVIEW OF PROVISIONS FOR THE TRANSPORT OF LITHIUM BATTERIES

5.1.1 Secondary Lithium Ion Batteries (DGP/23-WP/34)

5.1.1.1 The meeting was asked to consider adding provisions in the Technical Instructions which would facilitate the transport of large rechargeable lithium batteries in hybrid and electric vehicles. These batteries were currently being transported by means of State approvals. It was explained that to meet the requirements in automotive applications, these batteries were subject to comprehensive and extensive tests in addition to the tests required in subparagraph 38.3 of the UN *Manual of Tests and Criteria*. It was argued that cells and batteries which successfully pass such tests were safe for transport.

5.1.1.2 An actual amendment was not proposed, but the panel was asked to support considering provisions during the next biennium. Some members expressed that they had experience with these batteries, and it was felt that they were constructed to meet high levels of safety. They were currently being transported safely by means of approvals; incorporating conditions of these approvals into a new special provision would provide a common approach. It was felt, however, that additional requirements such as maximum size limits and testing would need to be considered.

5.1.1.3 The panel appreciated the opportunity to consider the issue over the course of the next biennium.

5.1.2 Spare Lithium Batteries (DGP/23-WP/39)

5.1.2.1 This paper was withdrawn as the issue was covered under DGP/23-WP/43 (see paragraph 5.1.3).

5.1.3 Portable Electronic Devices Containing Lithium Cells or Batteries and Spare Batteries Carried by Passengers Or Crew (DGP/23-WP/43)

5.1.3.1 An amendment to the passenger provisions for portable electronic devices containing lithium batteries was proposed. The amendment would require that:

- a) measures be taken to prevent unintentional activation; and
- b) the devices be turned off before checking them as checked baggage.

It was suggested that not taking these actions could result in a dangerous evolution of heat during flight.

5.1.3.2 It was agreed to add a requirement for measures to be taken to prevent unintentional activation. Adding a requirement for the devices to be turned off was not supported, recognizing that this would not always be possible.

5.1.3.3 It was also suggested that “metal” should appear in the reference to “lithium or lithium ion cells or batteries”. This was agreed.

5.1.3.4 The proposed amendment also included text to qualify the intent of “for personal use” by stating that two spare batteries for each kind of portable electronic device could be carried in carry-on baggage. The proposer recognized, however, that some devices needed more than two batteries and suggested to instead limit the number of spare batteries to the minimum number required to power each kind of portable electronic device. The new text was not agreed, recognizing that it would introduce an unnecessary restriction. During discussion, it was recognized that there were differences in the interpretation of whether the provision for two spare batteries which appeared at the end of 8.1.1.2 s) applied to lithium ion batteries exceeding a watt-hour rating of 100 Wh which were only accepted with the approval of the operator or whether it applied to all spare lithium batteries carried by passengers or crew. It was agreed that the limit applied only to lithium ion batteries exceeding the 100 Wh limit. It was noted that the structure of the provision in the 2007-2008 Edition made this clear and that the new tabulated format presented in DGP/23-WP/11 would also make this clear.

5.1.4 **Section II Lithium Batteries — Loading Requirements (DGP/23-WP/59)**

5.1.4.1 Discussion of this working paper was deferred until the convening of the working group on lithium batteries established during discussions of DGP/23-WP/72 (see paragraph 5.1.7).

5.1.5 **Marking and Labelling of Overpacks with Lithium Batteries (DGP/23-WP/69)**

5.1.5.1 It was noted that the application of the lithium battery handling label requirement was not specified for overpacks in Section II of Packing Instructions 965 to 970. A new paragraph was proposed for inclusion in these packing instructions. This was agreed.

5.1.6 **Lithium Batteries in the Post (DGP/23-WP/71, Addendum No. 1 and Addendum No. 2 to DGP/23-WP/71)**

5.1.6.1 The meeting was informed of an amendment adopted by the Universal Postal Union (UPU) to its Convention to permit equipment containing no more than four lithium cells or two lithium batteries in the international post. The panel was asked to harmonize the Technical Instructions with the changes to the UPU Convention. The amendment to the convention had been prompted by a desire by postal administrations to be able to offer services to companies looking to utilize the post to deliver products direct to consumers. In this respect the postal administrations wished to be able to compete on an equal basis with express cargo operators regarding the transport of lithium batteries

5.1.6.2 It was reported that a very conservative but practical approach had been taken in developing the amendment. Not more than four cells or two batteries would be permitted and only when contained in equipment. This meant that postal authorities were seeking to transport everyday consumer items like mobile phones, digital cameras, laptops, video cameras, walkie-talkies and radio-controlled toys. Training material and an operational manual for UPU-designated operators were developed, and both were presented to the meeting. Additional training material was planned to be produced in the near future, including a professionally-developed e-learning training courses intended for postal employees. Training material would be available on the UPU internal website in four languages.

5.1.6.3 It was noted that there had been an increase in the number of lithium batteries in products discovered in both the international and domestic postal systems as a result of increased popularity in on-line shopping and auctions. It was suggested that permitting limited quantities of lithium batteries, as long as they were transported in compliance with the Instructions, would have the potential of reducing the number of lithium batteries being sent unsafely through the post.

5.1.6.4 The meeting was briefed on operational issues which had been addressed, including:

- a) A point of contact distribution list of over 100 countries had been developed between UPU and IATA as a resource should questions arise as a result of x-ray screening. Work on expanding the list continued. The list would be shared with civil aviation authorities.
- b) The UPU Convention and associated Letter Post and Parcel Post Regulations were being reviewed to address concerns with laws making it illegal for a person to open mail not intended for them. It was recognized that this could hinder emergency response in the event of an incident.
- c) Labels and text were being developed for application on packages or mail containers as an indication they contained lithium batteries.
- d) An incident and accident reporting system was recommended in two new articles to the UPU Convention and Regulations, whereby reporting to the designated postal authorities was recommended.

It was explained that these operational and technical issues would be reviewed by the Postal Operations Council during upcoming fall meetings.

5.1.6.5 A proposed amendment to the Technical Instructions which would permit small quantities of lithium batteries in the post was presented in the addendum to the working paper. The provision would apply to excepted batteries contained in Section II of Packing Instructions 967 and 970. It was noted that should the amendment be agreed, an indication that the provision applied only to those batteries contained in equipment would be needed in the text.

5.1.6.6 Some members felt that as long as the Technical Instructions were complied with, there would be no logical reason not to accept the proposal on the basis that these batteries were currently excepted from most of the provisions of the Instructions. They agreed with the sentiment expressed by the UPU that permitting small quantities of lithium batteries would have the potential of reducing the number of lithium batteries being sent unsafely through the post. Some dangerous goods were already permitted in mail for air carriage; it seemed justifiable to extend this allowance as long as the Instructions were complied with.

5.1.6.7 Others felt that the proposal could not be supported. Concerns with adopting the proposal included:

- a) Issues related to the safe transport of lithium batteries were still being discussed within the panel; some members felt that until these issues were settled, considering the proposal would be premature.

- b) Difficulties related to shipper oversight due to the very large number of shippers in some States had been discussed by the panel (see paragraph 3.2). Adding regular consumers and postal workers to the equation would exacerbate this problem.
- c) Accessing mail in the event of an incident could be hindered in many States by laws which made it illegal for a person to open mail not intended for them. Similarly, inspections might be prohibited.
- d) Ensuring that everyone involved in the transport of these batteries was trained would be difficult if not impossible. Not only must they be trained, but recurrent training would also have to be implemented as would a system for retention of training records. There were millions of postal workers around the world at many different types of postal outlets such as convenience and grocery stores. Regular consumers might never know that there were any requirements in existence, let alone training requirements.
- e) The possibility of consumers placing packages in mailboxes might cause damage to the lithium batteries which was a safety concern;
- f) The role of postal workers in the dangerous goods supply chain was not defined in the Instructions. They were somewhat like a freight forwarder, somewhat like an operator.
- g) There was no mechanism in place to ensure that the UPU received and distributed changes to the regulations in a timely and efficient manner.
- h) Postal workers would not likely be aware of State and operator variations, some of which prohibit dangerous goods in airmail.
- i) While it was true that some patient specimens, infectious substances and radioactive material were permitted in the post, there was a very limited application of this allowance. In many instances, those who shipped these materials were specialists who were fully aware of their hazards.

5.1.6.8 The amendment was not agreed. However, the panel felt that discussions with UPU should continue with the goal of improving communication between postal and civil aviation authorities. It was recognized that coordination had been virtually non-existent on this issue; communication may have resulted in more constructive feedback from the DGP.

5.1.6.9 The decision not to adopt the proposal raised legal questions related to the variance that would now exist between the UPU Convention and the Technical Instructions. On the one hand, the UPU had followed due process and had the support of its Contracting States to change their Convention which governed mail. On the other hand, the DGP, through ICAO, was tasked with ensuring a system was in place for the safe transport of dangerous goods by air. Therefore, transporting mail bags containing dangerous goods by air was within the purview of ICAO.

5.1.6.10 The UPU expressed concern with the conflict between the UPU Convention and the Technical Instructions. It understood the concerns of the panel and endeavoured to do everything it could to address the issues raised. Support from the panel was sought in developing a joint UPU/ICAO letter

addressed to ICAO Contracting States and UPU members which would outline these issues. The panel had sympathy for UPU's concerns, and agreed to establish a joint working group with members of the appropriate UPU body. The work would begin through correspondence and continue at the lithium battery working group meeting which was anticipated for early 2012.

Other issues raised during discussion of the UPU proposal

5.1.6.11 The UPU proposal prompted other discussions related to dangerous goods in the post:

- a) It was queried whether or not lithium batteries shipped in compliance with Section II of the packing instructions would even be subject to the prohibition in the post. Some felt the fact that Section II consignments were not subject to other requirements of the Instructions meant that the batteries could be transported in the mail. This, however, was not the intent of Section II. The panel was reminded of the proposal agreed at this meeting (see paragraph 2.5.1 and DGP/23-WP/3 (English only, paragraph 3.2.31) to clarify that batteries shipped in compliance with Section II of Packing Instructions 965-970 were not excepted from the prohibition in airmail.
- b) Some panel members felt that the part of the proposal presented by the UPU which removed reference to the UPU Convention should be adopted. The Secretary advised the panel, however, that the UPU made this proposal in conjunction with the exception for lithium batteries in the post and could not be adopted separately. The deletion of the reference would need to be considered through a separate proposal.
- c) Differences in interpretation by the panel of the legal relationship between ICAO and UPU as well as whether or not Section II consignments of lithium batteries were subject to the prohibition in airmail made it clear that further clarification was necessary. This would be addressed at the lithium battery working group meeting at the beginning of 2012.
- d) One panel member provided results of a recent study at their State's national postal authority on measures which were in place to prevent dangerous goods from being carried in the mail. A random sample of over 30,000 packets and parcels led to an estimate that 1 to 3 per cent of all items sent by post in that State routinely contained dangerous goods. Most of these items were aerosols and ammunition but also included compressed gases, perfumes, cigarette lighters, lithium batteries, nail polish, acetone, paint and corrosive liquids. Other panel members reported similar findings within their States.

It was noted that although dangerous goods represented a small percentage of the packets and parcels moved by air each day, the potential catastrophic consequences of forbidden dangerous goods being sent in the mail necessitated the implementation of all reasonable mitigation measures available. Efforts to achieve this were ongoing within that State; it was suggested other States consider doing the same.

5.1.7 Lithium Battery Standards (DGP/23-WP/72 Revised and DGP/32-IP/11)

5.1.7.1 An amendment to the lithium battery requirements was proposed, based on concerns that the current requirements were not sufficient. Before presenting the proposal to the panel, representatives from the Federal Aviation Administration (FAA) Tech Center briefed the panel on test results related to lithium batteries. The following findings were presented:

- a) Small- and medium-scale propagation tests indicated that a single cell in thermal runaway could generate enough heat to cause adjacent cells to also go into thermal runaway. This propagation would consume all of the cells within the shipping package and also spread to adjacent packages.
- b) Halon 1301 would suppress open flames from lithium-ion cells in thermal runaway but would not stop the propagation from cell-to-cell. In the case of lithium metal cells, the Halon 1301 had no effect other than suppressing the spread of fire to adjacent materials.
- c) Package modification tests were conducted to investigate low-cost material alternatives to stop the propagation of thermal runaway should one cell fail. None were successful thus far. Chemical oxygen generator overpacks were shown to successfully contain a lithium-ion fire; however, they were not successful at containing a lithium metal fire.
- d) A risk model for freighter fire accidents caused by cargo compartment fire on freighter aircraft suggested that 6.2 accidents caused by cargo compartment fires would occur in the next 10 years, with 4.5 of those accidents related to lithium batteries. The model was based on United States' freighter aircraft accidents caused by fire in Class E cargo compartments. A significant increase in lithium battery shipments by air over the next ten years was projected.

5.1.7.2 The panel expressed its appreciation for information provided. The Deputy Director, Safety Standardization and Infrastructure of ICAO's Air Navigation Bureau described this work as an SMS-hazard identification issue that was an essential tool for addressing aviation safety issues. There were, however, some concerns with the study. Some felt the data and assumptions on which the risk model was based were not accurate in that a smaller percentage of batteries were actually shipped by air. A battery manufacturer representative reported that lithium metal batteries had a long shelf life and were therefore largely transported by sea. He also reported that industry statistics existed and could be provided to the panel. Others felt that although the actual numbers might not be precise, there was no doubt that there had been a proportionally large increase in the amount shipped by air and that this trend would likely continue.

5.1.7.3 Following the presentation, the proposal was presented. It was explained that the original intent of the proposal was to eliminate exceptions which currently existed for small lithium ion and lithium metal batteries. Eliminating the exceptions for lithium batteries contained or packed in equipment was not considered, as it was felt protection was provided by the equipment. Based on comments received from industry and other panel members, a modification to the proposal was made to allow for lower-risk shipments. This exception for very small batteries would recognize the significant role e-commerce played in the lithium battery and portable electronic industry while still eliminating many of the risks.

5.1.7.4 The justification for the proposal was based on the findings presented by the FAA Tech Center (see paragraph 5.1.7.1) as well as on many arguments made at previous panel and working group meetings. These included:

- a) Exceptions from the full regulations for lithium batteries did not seem justifiable considering that they were felt necessary for many other common less hazardous commodities such as paint and dry ice.
- b) Under the exceptions, the pilot was not provided information which he would be provided under the full regulations such as the quantity, location and the types of lithium batteries on board the aircraft. The unique properties of a lithium battery fire could affect a pilot's decision-making process in an emergency situation if he had this information. Emergency responders would also be in a better position to respond to an emergency situation once the aircraft had landed if they had this information.
- c) Training requirements for excepted batteries were less stringent than they were for fully-regulated batteries. A key element of the regulations essential to safety was therefore lost. This did not seem justifiable, considering that lithium batteries posed a more substantial risk than many other dangerous goods subject to the full training requirements.
- d) An operator acceptance check and inspection was not required for excepted batteries. This could increase the chances of a damaged package being transported.
- e) The excepted batteries did not require a hazard label. A lithium battery handling label was required, but its effectiveness was questioned:
 - 1) Shippers who were required to apply the handling label were not required to have dangerous goods training, reducing the likelihood of compliance.
 - 2) General cargo acceptance personnel were not required to read the handling label or inspect the package for damage.
 - 3) Emergency responders were trained to respond to hazard class labels and UN numbers on packages — this information was lost.

5.1.7.5 It was suggested that when the revised provisions for lithium batteries were developed for the 2009-2010 Edition of the Technical Instructions, which included provisions for small quantities of lithium batteries not being subject to all of the requirements of the Instructions, it could not be foreseen that some shippers of lithium batteries would take advantage of the provisions to facilitate the shipment of such items in bulk. Since no limit was placed on the number of packages containing lithium batteries, large quantities of excepted batteries were being consolidated in overpacks, pallets, in single unit load devices, and in single aircraft cargo compartments. This increased the risk in a fire situation, regardless of whether the fire was initiated by the batteries themselves or by an outside source.

5.1.7.6 The proposer felt that by adopting the amendment, a significant amount of the risks would be eliminated. Training would be required for shippers transporting lithium batteries, operator acceptance checks for compliance prior to loading and stowage aboard an aircraft would be required, and pilots would be notified of the presence, location and quantity of lithium batteries aboard the aircraft. At

the same time, the significant role e-commerce played in the lithium battery and portable electronic industries would be addressed by allowing for very small shipments of cells and batteries that occurred via Internet sales and service. It was recognized that there would be an impact on the shipping industry, but it was felt that the benefits to safety made this impact worthwhile. It was believed that the reduction in quantity would make the use of the reduced provisions non-cost effective, and shippers would therefore elect to ship their batteries as fully-regulated shipments. Although this might not be the ultimate solution, and further changes might be required in the future, it was felt that to err on the side of safety was appropriate. The approach would bring most lithium batteries into the regulated dangerous goods transportation system.

5.1.7.7 There was some support for the proposal. It was recognized that only the quantity limits changed; the regulatory structure was retained, and it more accurately reflected the original intent of the panel. It was essential that such items were notified to the pilot in command, and the proposal presented a good compromise between fully regulating all batteries and maintaining the current limits. The proposal was an evolution of the current requirements and reflected new understanding of how batteries moved by air.

5.1.7.8 Some members felt they could not give proper consideration to the proposal, as the modification was presented at a late stage making it impossible for them to seek necessary consultation within their States. The proposer explained that the modification was made to the original paper in an attempt to address industry concerns. Those concerns had been raised after the original paper was published. The Secretary noted that in the past, late papers were not uncommon at DGP and, while considering time restraints, every effort was made to consider these papers, especially if they addressed safety threats. This fact was recognized by the panel, but because this amendment would have a significant impact if it were adopted, consultation was deemed necessary.

5.1.7.9 A majority of members did not agree with the proposal for a number of reasons including:

- a) Although there had been incidents involving lithium batteries, it was suggested these were caused by shippers not complying with the existing requirements and not by a weakness in them.
- b) Much time and effort was devoted to ensuring the current requirements, which were developed for the 2009-2010 Edition of the Instructions, were sufficient. They represented a 66% reduction in the quantity limit per package for lithium ion batteries, a 90% reduction for lithium metal batteries and a new lithium battery handling label. It was felt that these reductions were sufficient to significantly reduce risk.
- c) A cornerstone of compliance was stability of regulations. In the three years since their introduction, shippers were now getting used to the provisions and to change now, without any definitive safety case, could not be justified. There would need to be a huge re-education process. Questions were still being received from some shippers on the current requirements; to change them yet again would cause confusion, which could potentially impact safety.

- d) The proposal would not achieve its aim because the same number of batteries would still be shipped in bulk — although the quantity of batteries per package would be smaller, the number of packages would simply increase.
- e) If changes were made in haste, further changes might be necessary should all aspects not be adequately addressed.
- f) Shippers had expended considerable resources in their efforts to comply with the current requirements; increased costs could result in an increase of intentional non-compliances.
- g) There was no proof that increasing the requirements would result in an increase in safety.

5.1.7.10 The proposer agreed that maintaining stable regulations was important, but suggested this should not stop the panel from making changes if safety deficiencies were identified. Determining the risks associated with the transport of articles and devices such as lithium batteries was not as straight forward as was the case for substances and materials. Methodologies for risk determination of substances and materials had been well established for many years. Once the risk was determined, it was unlikely to change. With new articles and devices, market reaction and changes in technology could result in increased risks which the panel would need to react to. There were, however, new technologies which could be used to help better determine these risks. Test results could be used as a tool in efforts to be predictive rather than reactive. Waiting for an incident or an accident to happen before making changes was not an option.

5.1.7.11 Although the majority of panel members did not support the amendment proposed, there was a consensus that the whole subject of lithium batteries needed to be reviewed. One specific area which needed to be addressed was how to provide for details of packages containing small quantities of lithium batteries to appear on the notification to the pilot in command. This could not be done in a piecemeal fashion, and it was felt the best way of achieving this would be to hold a working group to consider all aspects of the subject. Accordingly, the panel agreed to schedule a working group in early 2012.

5.1.7.12 During the discussion on the proposal, it was reported that differences remained among operators in the interpretation of what their level of responsibility for excepted batteries was. This had been discussed at an earlier working group (DGP-WG/09), and the working group had confirmed that for excepted batteries, operators had no responsibility for an acceptance check or special handling of these consignments; shippers could consign unit load devices or pallets of packages containing lithium batteries; and freight forwarders could consolidate multiple consignments of packages of lithium batteries into a unit load device.

5.1.8 **Lithium Ion Battery-Powered Mobility Aids** (DGP/23-WP/75, Revised)

5.1.8.1 The meeting was informed of new designs of mobility aids which required the lithium ion battery to be removed from the equipment to permit efficient and effective stowage and transport of the mobility aid. It was suggested that it would be safer to require that the removed lithium ion battery be carried in the aircraft cabin rather than being left as checked baggage with the mobility aid. It was reported that these mobility aids required lithium ion batteries with a capacity that exceeded the 160 Wh

limit provided in the current provision. It was therefore proposed to establish a limit of 300 Wh for batteries which must be removed during transport.

5.1.8.2 The amendment was revised and discussed in conjunction with proposals in DGP/23-WP/57 (see paragraph 2.9.4 and DGP/23-WP/80 (see paragraph 5.1.9)). It was agreed, subject to editorial amendments and clarification that when applicable, the battery must be removed by the user.

5.1.9 **Spare Lithium-Ion Batteries for Battery-Powered Wheelchairs (DGP/23-WP/80)**

5.1.9.1 The passenger and crew provisions in Part 8 were extended at DGP/22 to include lithium battery powered mobility aids. Permitting the carriage of spare batteries by passengers and crew was also considered at DGP/22, but the panel decided not to allow them because the watt-hour rating of these batteries exceeded 160 Wh.

5.1.9.2 DGP/23 was informed of new batteries developed for wheelchairs which did not exceed the 160 Wh hour rating. It was therefore proposed to include spare lithium ion batteries for battery-powered wheelchairs in the passenger provisions.

5.1.9.3 The amendment was revised and discussed in conjunction with proposals in DGP/23-WP/57 (see paragraph 2.9.4) and DGP/23-WP/75, Revised (see paragraph 5.1.8). It was agreed.

5.1.10 **Lithium Batteries (DGP/23-WP/81)**

5.1.10.1 The Secretary informed the panel of concerns expressed by the ANC following DGP/22 on the subject of lithium batteries, particularly on the bulk shipment of them. Concerns which were raised by the ANC included:

- a) Exceptions from the full requirements of the Technical Instructions;

The ANC understood that the issue of exceptions originated at the United Nations and would be better addressed there, but the DGP should review the exceptions from an aviation mode perspective.

- b) Whether or not new tests would be necessary;
- c) Outreach and guidance on the safe transport of lithium batteries;
- d) Improved training for all involved in their transport.

5.1.10.2 Members were invited to note the concerns raised and to inform the meeting of any initiatives in relation to outreach, guidance and training that had been undertaken in their States or organizations.

5.1.10.3 Several outreach activities were reported:

- a) One member reported that his State was in the process of producing an educational video intended for shippers, senders (mail), passengers and operators.

- b) Another member provided the panel with some of his State's initiatives which included posters with pictograms drawing attention to lithium batteries. Plans to target younger travellers through education were being considered. One idea was to educate through colouring books offered while travelling by air.
- c) A representative from the battery industry reported on coordinated efforts to produce a video on shipping lithium batteries which would include references to the Instructions. It would be available in multiple languages.
- d) Another member reported guidance on his civil aviation authority's website which included text and pictures related to lithium batteries, lithium batteries contained in equipment, and lithium batteries packed in equipment. The material was available in multiple languages.
- e) Another member provided the panel with some of the material his organization had developed for shippers of lithium batteries and for passengers to alert about lithium batteries in baggage. In addition, a two-day workshop on lithium batteries was being held in Shanghai three weeks after the panel meeting.

**5.1.11 Lithium Battery Pilot Notification Requirements
(DGP/23-WP/95)**

5.1.11.1 Discussion of this working paper was deferred until the convening of the working group on lithium batteries which was established during discussions of DGP/23-WP/72 (see paragraph 5.1.7).

**5.1.12 Use of "Not Restricted" in Section II of Lithium
Battery Packing Instructions (DGP/23-WP/97)**

5.1.12.1 Section II of the lithium battery packing instructions requires shippers to indicate on the air waybill what type or types of lithium batteries are contained in a consignment, the applicable packing instruction number, and the words "not restricted". It was reported that some shippers and manufacturers have interpreted "not restricted" to mean that the consignment does not contain dangerous goods and have put a statement to this effect in information provided to their customers. It was suggested that "not restricted" was not appropriate and a proposal to instead require "complies with Section II" was made.

5.1.12.2 There was strong support for the proposal. Many misinterpretations of "not restricted" had been reported, one being that not restricted meant that the consignment was no longer considered to contain dangerous goods. The amendment, subject to a small editorial revision, was agreed.

**5.1.13 Revision to Section II of Lithium Battery Packing
Instructions (DGP/23-WP/101, Revised)**

5.1.13.1 It was suggested that prohibitions which were included at the beginning of Packing Instructions 965 to 970 relating to defective batteries, waste batteries, batteries shipped for recycling, etc. should be reproduced at the beginning of Section II of these packing instructions. It was also suggested that a reference to the new requirements for cells and batteries to be manufactured under a quality management programme which were adopted in Part 2;9.3 should be added to all lithium battery packing instructions.

5.1.13.2 The amendment was agreed, subject to editorial amendments.

5.2 RECOMMENDATION

5.2.1 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.

5.3 AGENDA ITEM 5.2: DEVELOPMENT OF PROVISIONS FOR THE CARRIAGE OF DANGEROUS GOODS ON HELICOPTERS

5.3.1 Carriage of Dangerous Goods by Helicopters (DGP/23-WP/65)

5.3.1.1 The subject of the carriage of dangerous goods by helicopters had begun prior to DGP/22 and continued at DGP-WG/10 and DGP-WG/11. The lack of specific reference to helicopter operations had been interpreted by those groups to mean that all of the provisions within the Technical Instructions applied to those operations. It was recognized, however, that helicopter operations differed greatly from fixed-wing operations, due to the nature of the aircraft involved and the types of operation being carried out. Accordingly, amendments to the Technical Instructions and the Supplement were presented to the meeting. Three levels of amendments were described:

- a) a high level amendment in Part 1 of the Technical Instructions making it clear that the provisions of the Technical Instructions applied to dangerous goods carried by any aircraft, whether internally or externally;
- b) amendments to address provisions in the Technical Instructions which would be impossible for helicopters to comply with; and
- c) amendments to address operations which could not be performed without an approval.

5.3.1.2 Many comments were provided, including:

- a) a helicopter was not interpreted by some as being a cargo aircraft; referring to cargo packages on a helicopter would therefore be more appropriate;
- b) allowing the notification to the pilot-in-command to be abbreviated was questioned, as some felt all items currently required in the Instructions should be required for

helicopters, although another form might be acceptable (one member reported using checklists in their State);

- c) emergency response information should be more than a statement in the operations manual to land (a quick landing is not always possible);
- d) the definition for external carriage should be limited to helicopters and not expanded to aircraft;
- e) reference to single-crew helicopter operations was inappropriate;
- f) dangerous goods should not be allowed in the passenger cabin; and
- g) mandatory training requirements for helicopters carrying dangerous goods should be stressed.

5.3.1.3 A working group met for a detailed discussion on the amendments and comments provided by the panel. A revised proposal was presented based on the above and agreed. The panel expressed great appreciation to the group who developed the amendments, noting that provisions for helicopters were a necessary addition to the Technical Instructions.

5.4 RECOMMENDATION

5.4.1 In light of the foregoing discussions, the meeting developed the following recommendations:

Recommendation 5/2 — Addition of provisions for the carriage of dangerous goods on helicopters in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284)

That provisions for the carriage of dangerous goods on helicopters be added to the Technical Instructions as indicated in Appendix B to the report on this agenda item.

Recommendation 5/3 — Addition of provisions for the carriage of dangerous goods on helicopters in the *Supplement to the Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284, Supp)

That provisions for the carriage of dangerous goods on helicopters be added to the Supplement to the Technical Instructions as indicated in Appendix C to the report on this agenda item.

5.5 **AGENDA ITEM 5.3: REVIEW OF PROVISIONS FOR INFORMATION TO THE PILOT-IN-COMMAND**

5.5.1 **Proposed Amendments to Notification-to-Pilot-in-Command Provisions (DGP/23-WP/35 and DGP/23-WP/35, Addendum)**

5.5.1.1 An amendment to Part 7;4.1 was proposed whereby dangerous goods information would be required to be provided to the flight dispatcher in addition to the pilot-in-command. It was suggested that this would allow aircraft rescue and fire fighting (ARFF) personnel to have dangerous goods information provided to them in an expeditious manner. It was noted that dispatchers already shared responsibility with the pilot for many aspects of a flight, including emergency situations. Since requirements for dispatchers were contained in Annex 6 and the term “flight operations officer/flight dispatcher” was used in that Annex, the proposal was revised to refer to that term. “Flight dispatcher” on its own was also deemed to be too restrictive.

5.5.1.2 The proposal was supported in principle, but a number of concerns were raised:

- a) Some members felt that the terminology should be further broadened to include designated ground personnel responsible for flight operations; this was added.
- b) One member felt that further clarification was needed to ensure that the pilot-in-command and the flight dispatcher received the same information. Most felt that this was already clear, but that the text could be revised to indicate that a copy of the NOTOC was acceptable. It was noted that there would be no requirement for anyone other than the pilot-in-command to sign the document.
- c) It was proposed that the new terminology would need to be reflected in the training requirements in Table 1-4 and Table 1-5, but the panel felt this was unnecessary as training would be required for flight dispatchers and flight operations officers under the Annex 6 requirements. The requirement was removed, but it was agreed to raise the issue at the joint working group established with the Operations Panel (OPSP) (see paragraph 6.3).
- d) It was suggested that text clarifying the intent of the requirement would make implementation more effective, as people were more likely to respond to outcome-based requirements.
- e) It was agreed that a transition period would be provided to allow operators time to implement the new requirement.

5.5.1.3 A revised proposal which addressed concerns raised by the panel was agreed.

5.5.2 **Review of the Requirements for the Provision of Information to the Pilot-in-Command (DGP/23-WP/96)**

5.5.2.1 The meeting was briefed on work undertaken by the Working Group on the Notification to Captain. Differences in opinion were reported on whether or not the current provisions were adequate

or whether they should be amended. Some believed the current provisions were adequate, while others believed that new technologies could be employed to simplify what was currently required and to add new elements which were not currently required. The Secretary noted that ensuring the right information was transferred to the right parties was key, regardless of the amount of information available.

5.5.2.2 It was agreed that the issue had a broader scope than initially envisaged. A thorough analysis of information requirements for all involved in emergency response would need to be undertaken. A working group by correspondence would be established during the next biennium.

5.6 RECOMMENDATION

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

Recommendation 5/4 — Amendment to notification to the pilot-in-command provisions in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284)

That provisions related to notification to the pilot-in-command provisions in the Technical Instructions be amended as indicated in Appendix D to the report on this agenda item.

5.7 AGENDA ITEM 5.4: DEVELOPMENT OF PERFORMANCE STANDARDS FOR STATE EMPLOYEES

5.7.1 Competency Framework For State Employees (DGP/23-WP/52) and Competency Frameworks for Shippers and Freight Forwarders (DGP/23-WP/82)

5.7.1.1 An amendment to the Technical Instructions incorporating a reference to competency-based training and an amendment to the Supplement to the Technical Instructions incorporating guidance on competency-based training along with a competency framework for State employees was proposed. The competency framework was developed by the DGP training working group for State employees involved in the regulation and oversight of the air transport of dangerous goods under the chairmanship of Mr. T. Muller of the Netherlands. It had been presented to DGP-WG/11 and was agreed in principle.

5.7.1.2 Competency frameworks for personnel of shippers and freight forwarders involved in the regulation and oversight of air transport of dangerous goods had been developed by a Secretariat working group. Before presenting the frameworks, a technical officer from ICAO's Aviation Safety Training Section (AST) was invited to provide information to the meeting on ICAO's Civil Aviation Training Policy. She informed the meeting that the purpose of the policy was to ensure that all training provided by ICAO or third parties on behalf of ICAO met rigorous standards for the design and development of training courses. This would include the organization's current objective of evolving toward more competency-based training. The technical officer provided a brief description of what was meant by competency-based training. She reported that ICAO had been developing competency frameworks for over a decade. Frameworks for multi-crew licensing (MPL), designated medical examiners, flight

procedures designers, flight validation pilots and aircraft maintenance personnel were completed and frameworks for air traffic controllers, air traffic electronics personnel, and aeronautical information management personnel were being developed. The *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868) provided the actual procedures for training organizations to apply in providing training for aeronautical personnel.

5.7.1.3 The panel was asked to review the frameworks for shippers and freight forwarders and to provide comments. The panel was also asked to consider whether or not it felt there was a need for additional guidance material to support States in their implementation of the frameworks. Finally, the group was asked to instruct the Secretariat on any follow-up action which might be necessary, such as the development of competency frameworks for other dangerous goods personnel.

5.7.1.4 The amendment and the frameworks were welcomed by the panel. It was recognized that guidance for developing training programmes was lacking and that this material would be an invaluable tool for States as they structured their training programmes. There was currently a wide variation on how training was conducted around the world; the frameworks would provide a more consistent approach.

The panel considered whether the competency frameworks should be incorporated in the Supplement, in the PANS-TRG or in a standalone document (see Attachments A, B, and C to Appendix E). It was agreed that standalone documents would be most appropriate at this time.

5.8 RECOMMENDATION

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

Recommendation 5/5 — Addition of provisions for competency-based training in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284)

That provisions for competency-based training be added to the Technical Instructions as indicated in Appendix E to the report on this agenda item and that the competency frameworks presented in Attachments A, B, and C to Appendix E be published in an ICAO Circular.

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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 8

**PROVISIONS CONCERNING
PASSENGERS AND CREW**

...

1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

The amendments to Part 8 are based on the new structure agreed under discussions of Agenda Item 2 (See paragraph 2.9.1 of this report).

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

...

See paragraphs 2.9.4, 5.1.8 and 5.1.9 of this report:

e5) Battery-powered wheelchairs or other similar mobility aids with non-spillable <u>wet</u> batteries <u>or with batteries which comply with Special Provision A123</u>	Yes	No	No	Yes	(see 5 e) iv)	<p>4a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg);</p> <p>2b) <u>non-spillable batteries</u> must comply with Special Provision A67 or the vibration and pressure differential tests of Packing Instruction 872;</p> <p>3c) <u>the operator must verify that:</u></p> <p>Reorder paragraphs i), ii) and iii) as indicated:</p> <p><u>ii)</u> the battery terminals <u>must be are</u> protected from short circuits (e.g. by being enclosed within a battery container);</p> <p><u>4i)</u> the battery <u>must be is</u> securely attached to the wheelchair or mobility aid;</p> <p><u>5iii)</u> <u>electrical circuits have been isolated, the operator(s) must ensure</u></p>
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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			
						<p>that:</p> <ul style="list-style-type: none"> — wheelchairs or other battery-powered mobility aids are carried in such a manner so as to prevent unintentional activation; and — they are protected from being damaged by the movement of baggage, mail, stores or other cargo; <p>d) <u>devices must be carried in a manner such that they are protected from being damaged by the movement of baggage, mail, stores or other cargo;</u></p> <p>e) <u>where a battery-powered wheelchair or other similar mobility aid is specifically designed to allow its battery(ies) to be removed by the user (e.g. collapsible):</u></p> <ul style="list-style-type: none"> <u>i) the battery(ies) must be removed. The wheelchair or mobility aid may then be carried as checked baggage without restriction;</u> <u>ii) the removed battery(ies) must be carried in strong, rigid packagings which must be stowed in the cargo compartment;</u> <u>iii) the battery(ies) must be protected from short circuit;</u> <u>iv) the pilot-in-command must be informed of the location of the packed battery; and</u> <p>f) it is recommended that passengers make advance arrangements with each operator.</p>

See paragraphs 2.9.4, 5.1.8 and 5.1.9 of this report:

f6) Battery-powered wheelchairs or other similar mobility aids with spillable batteries	Yes	No	No	Yes	Yes	<p>4a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg);</p> <p>2b) the wheelchair or mobility aid can be loaded, stowed, secured and unloaded always in an upright position and the;</p> <p>c) <u>the operator must verify that:</u></p> <p>Reorder paragraphs i), ii) and iii) as indicated:</p> <p>ii) <u>battery terminals are protected from short circuits (e.g. by being enclosed within a battery container);</u> <u>and</u></p>
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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			
						<p>i) <u>and</u> the battery is securely attached to the wheelchair or mobility aid;</p> <p>iii) <u>electrical circuits have been isolated;</u></p> <p>3d) <u>the operator(s) devices must ensure that wheelchairs or other battery-powered mobility aids are be carried in such a manner so as to prevent unintentional activation and such</u> that they are protected from being damaged by the movement of baggage, mail, stores or other cargo;</p> <p>4e) if the wheelchair or mobility aid cannot be loaded, stowed, secured and unloaded always in an upright position, the battery(ies) must be removed and. The wheelchair or mobility aid may then be carried as checked baggage without restriction;</p> <p>5f) the removed battery must be carried in strong, rigid packagings as follows:</p> <ul style="list-style-type: none"> — the packagings must be leaktight, impervious to battery fluid and be protected against upset by securing them to pallets or by securing them in cargo compartments using appropriate means of securement (other than by bracing with freight or baggage) such as by use of restraining straps, brackets or holders; — batteries must be protected against short circuits, secured upright in these packagings and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; <p>See paragraph 3.2.29 of DGP/23-WP/2:</p> <ul style="list-style-type: none"> — these packagings must be marked “Battery, wet, with wheelchair” or “Battery, wet, with mobility aid” and be labelled with a “Corrosive” label (Figure 5-22) and with a package orientation labels (Figure 5-26) <u>as required by 5.3.3;</u> <p>6g) <u>the pilot-in-command must be informed of the location of the wheelchair or mobility aid with an installed battery or the location of a packed battery.</u></p> <p>h) it is recommended that passengers make advance arrangements with each operator; also unless batteries are</p>

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			
						nonspillable they should be fitted, where feasible, with spill-resistant vent caps.

See paragraph 3.2.51 of DGP/23-WP/3 and paragraphs 2.9.4, 5.1.8 and 5.1.9 of this report:

g7) Lithium-ion battery-powered wheelchairs or other similar mobility aids	Yes	(see 7 e)	No	Yes	Yes	<p>4a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg);</p> <p>2b) the batteries must be of a type which meets the requirements of each test in the UN <i>Manual of Tests and Criteria</i>, Part III, sub-section 38.3;</p> <p>3c) <u>the operator must verify that:</u></p> <p>Reorder paragraphs i), ii) and iii) as indicated:</p> <p>ii) <u>the battery terminals must be are</u> protected from short circuits (e.g. by being enclosed within a battery container); <u>and</u></p> <p>i) <u>the battery is</u> securely attached to the <u>wheelchair or</u> mobility aid; <u>and</u></p> <p>iii) <u>electrical circuits have been isolated;</u></p> <p>4d) <u>the operator(s) devices must ensure that such mobility aids are be</u> carried in a manner <u>so as to prevent unintentional activation and such</u> that they are protected from being damaged by the movement of baggage, mail, stores or other cargo; <u>and</u></p> <p>e) <u>where a battery-powered wheelchair or other similar mobility aid is specifically designed to allow its battery(ies) to be removed by the user (e.g. collapsible):</u></p> <p>i) <u>the battery(ies) must be removed and carried in the passenger cabin;</u></p> <p>ii) <u>the battery terminals must be protected from short circuit (by insulating the terminals e.g. by taping over exposed terminals);</u></p> <p>iii) <u>the battery must be protected from damage (e.g. by placing each battery in a protective pouch);</u></p> <p>iv) <u>removal of the battery from the device must be performed by following the instructions of the manufacturer or device owner;</u></p>
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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			
						<p><u>v) the battery must not exceed 300 Wh;</u></p> <p><u>vi) a maximum of one spare battery not exceeding 300 Wh or two spares not exceeding 160 Wh each may be carried; and</u></p> <p><u>e) the pilot-in-command must be informed of the location of the lithium ion battery(ies).</u></p> <p><u>f) it is recommended that passengers make advance arrangements with each operator.</u></p>

...

s19 Portable electronic devices (such as watches, calculating machines, cameras, cellular phones, laptop computers,) camcorders, etc.)

See paragraph 5.1.3 of this report:

Portable electronic devices containing lithium <u>metal</u> or lithium ion cells or batteries	Yes	Yes	Yes	No	No	<p><u>4a)</u> carried by passengers or crew for personal use;</p> <p><u>2b)</u> should be carried as carry-on baggage; <u>and</u></p> <p><u>3c)</u> each battery must not exceed the following:</p> <ul style="list-style-type: none"> — 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;<u>i</u> <p>See paragraph 5.1.3 of this report:</p> <p><u>d) if devices are carried in checked baggage, measures must be taken to prevent unintentional activation; and</u></p> <p>See paragraph 3.2.53 of DGP/23-WP/3:</p> <p><u>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, sub-section 38.3.</u></p>
Spare batteries for portable electronic devices containing lithium <u>metal</u> or lithium ion cells or	No	Yes	Yes	No	No	<p><u>4a)</u> carried by passengers or crew for personal use;</p> <p><u>2b)</u> must be individually protected so as to prevent short circuits (by placement in</p>

<i>Items or Articles</i>	<i>Location</i>			<i>Approval of the operator(s) is required</i>	<i>The pilot-in-command must be informed</i>	<i>Restrictions</i>
	<i>Checked Baggage</i>	<i>Carry-on Baggage</i>	<i>On the person</i>			
batteries						<p>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);</p> <p>3c) each battery must not exceed the following:</p> <ul style="list-style-type: none"> — 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; <u>and</u> <p>See paragraph 3.2.53 of DGP/23-WP/3:</p> <p><u>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, sub-section 38.3.</u></p>

...

Part 4

PACKING INSTRUCTIONS

...

Packing Instruction 965

Passenger and cargo aircraft for UN 3480

This entry applies to lithium ion or lithium polymer batteries.

~~Lithium 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).

See paragraph 2.3.3 of this report:

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are ~~prohibited~~ ~~forbidden~~ from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

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 the paragraphs above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

<i>Contents</i>	<i>Package quantity (Section I)</i>	
	<i>Passenger</i>	<i>Cargo</i>
Lithium ion cells and batteries	5 kg-G	35 kg-G

See paragraph 2.5.1.9 of this report:

ADDITIONAL PACKING 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 in~~ 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.

See paragraph 2.5.1.1 of this report:

OUTER PACKAGINGS*Boxes*

Aluminium (4B)
Fibreboard (4G)
Natural wood (4C1, 4C2)
Other metal (4N)
Plastics (4H2)
Plywood (4D)
Reconstituted wood (4F)
Steel (4A)

Drums

Aluminium (1B2)
Fibre (1G)
Other metal (1N1)
Plastics (1H2)
Plywood (1D)
Steel (1A2)

Jerricans

Aluminium (3B2)
Plastics (3H2)
Steel (3A2)

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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.

Lithium ion cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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
Lithium ion cells and batteries	10 kg G	10 kg G

ADDITIONAL PACKING 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium ion batteries”, “~~not restricted~~” and “~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium ion or lithium polymer batteries packed with equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

<p><i>Contents</i> <i>UN Number and Name</i></p>	<p><i>Package quantity</i> <i>(Section I)</i></p>	
	<i>Passenger</i>	<i>Cargo</i>
<p>Quantity of lithium ion cells and batteries per package, excluding equipment UN 3481 Lithium ion batteries packed with equipment</p>	<p>5 kg <u>of lithium ion cells or batteries</u></p>	<p>35 kg <u>of lithium ion cells or batteries</u></p>

ADDITIONAL PACKING 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.

OUTER PACKAGINGS*Boxes*

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Plastics (4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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).

Lithium ion cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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).

ADDITIONAL PACKING REQUIREMENTS

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.
- 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.
- The maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares.
- Lithium ion 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.
- 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium ion batteries”, ~~“not restricted”~~ and ~~“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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium ion or lithium polymer batteries contained in equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Equipment must be packed in strong outer packagings that conform to Part 4;1.1.1, 1.1.3.1 and 1.1.9 (except 1.1.9.1).

See paragraph 3.2.12 of DGP/23-WP/3:

<p><u>Contents</u> <u>UN number and name</u></p>	<p><u>Net quantity per piece of equipment-Package quantity (Section I)</u></p>	
	<p><u>Passenger</u></p>	<p><u>Cargo</u></p>
<p><u>UN 3481</u> Lithium ion batteries contained in equipment</p>	<p>5 kg <u>of lithium ion cells or batteries</u></p>	<p>35 kg <u>of lithium ion cells or batteries</u></p>

ADDITIONAL PACKING 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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

 See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

 See paragraph 5.1.13 of this report:

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).

Lithium ion cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

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.

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).

ADDITIONAL PACKING 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 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words "lithium ion batteries", "~~not restricted~~" and "~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium metal or lithium alloy batteries in Class 9 (Section I) and lithium metal or lithium alloy batteries subject to specific requirements of these Instructions (Section II).

~~Lithium 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).

See paragraph 2.3.3 of this report:

Waste lithium batteries and lithium batteries being shipped for recycling or disposal are ~~prohibited~~ forbidden from air transport unless approved by the appropriate national authority of the State of Origin and the State of the Operator.

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 the paragraphs above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

Contents	Package quantity (Section I)	
	Passenger	Cargo
Lithium metal cells and batteries	2.5 kg 	35 kg 

See paragraph 2.5.1.9 of this report:

ADDITIONAL PACKING 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 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, and in 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.
 - Cells and batteries must be surrounded by cushioning material that is non-combustible and non-conductive, and placed inside an outer packaging.

See paragraph 2.5.1.1 of this report:

OUTER PACKAGINGS

<i>Boxes</i>	<i>Drums</i>	<i>Jerricans</i>
Aluminium (4B)	Aluminium (1B2)	Aluminium (3B2)
Fibreboard (4G)	Fibre (1G)	Plastics (3H2)
Natural wood (4C1, 4C2)	<u>Other metal (1N1)</u>	Steel (3A2)
<u>Other metal (4N)</u>	Plastics (1H2)	
Plastics (4H2)	Plywood (1D)	
Plywood (4D)	Steel (1A2)	
Reconstituted wood (4F)		
Steel (4A)		

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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.

Lithium metal or lithium alloy cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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
Lithium metal cells and batteries	2.5 kg G	2.5 kg G

ADDITIONAL PACKING 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 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium metal batteries”, “~~not restricted~~” and “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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium metal or lithium alloy batteries packed with equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, sub-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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;

- 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).

General requirements

Part 4;1 requirements must be met.

See paragraph 3.2.12 of DGP/23-WP/3:

<p><i>Contents</i> <i>UN number and name</i></p>	<p><i>Package quantity</i> <i>(Section I)</i></p>	
	<i>Passenger</i>	<i>Cargo</i>
<p>Quantity of lithium metal cells and batteries per overpack, excluding equipment <u>UN 3091 Lithium metal batteries packed with equipment</u></p>	<p>5 kg <u>of lithium metal cells or batteries</u></p>	<p>35 kg <u>of lithium metal cells or batteries</u></p>

ADDITIONAL PACKING 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.
- Each completed package containing lithium cells or batteries must be marked and labelled in accordance with the applicable requirements of 5;1, 5;2 and 5;3.
- 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.

OUTER PACKAGINGS*Boxes*

Aluminium (4B)
 Fibreboard (4G)
 Natural wood (4C1, 4C2)
 Plastics (4H2)
 Plywood (4D)
 Reconstituted wood (4F)
 Steel (4A)

Drums

Aluminium (1B2)
 Fibre (1G)
 Plastics (1H2)
 Plywood (1D)
 Steel (1A2)

Jerricans

Aluminium (3B2)
 Plastics (3H2)
 Steel (3A2)

See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8:1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

See paragraph 5.1.13 of this report:

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).

Lithium metal cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2:9.3.1 e).

General requirements

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).

ADDITIONAL PACKING REQUIREMENTS

- Cells and batteries must be packed in inner packagings that completely enclose the cell or battery.
- 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 maximum number of batteries in each package must be the minimum number required to power the equipment, plus two spares.
- 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.
- 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words “lithium metal batteries”, “~~not restricted~~” and “~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.5 of this report:

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

This entry applies to lithium metal or lithium alloy batteries contained in equipment.

~~Lithium 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).

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 the paragraph above, are not subject to other additional requirements of these Instructions.

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.

See paragraph 5.1.13 of this report:

Each cell or battery must:

- 1) be of the type proven to meet the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, ~~sub~~-section 38.3; ~~and~~

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 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).

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).

See paragraph 3.2.12 of DGP/23-WP/3:

Package contents UN number and name	Net quantity per piece of equipment- Package quantity (Section I)	
	Passenger	Cargo
Lithium metal batteries UN 3091 Lithium metal batteries contained in equipment	5 kg of lithium metal cells or batteries	35 kg of lithium metal cells or batteries

ADDITIONAL PACKING 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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packaging

 See paragraph 3.2.31 of DGP/23-WP/3:

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) and 8;1.1 (Provisions for dangerous goods carried by passengers or crew), 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.

 See paragraph 5.1.13 of this report:

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).

Lithium metal cells and batteries may be offered for transport if they meet 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, sub-section 38.3. However, 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, sub-section 38.3 may continue to be transported;

Note.— Batteries are subject to these tests irrespective of whether the cells of which they are composed have been so tested.

- 4) cells and batteries must be manufactured under a quality management programme as described in 2;9.3.1 e).

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.

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).

ADDITIONAL PACKING 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;
 - a telephone number for additional information; and

See paragraph 5.1.12 of this report:

- the words "lithium metal batteries", "~~not restricted~~" and "~~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.

OUTER PACKAGINGS*Boxes**Drums**Jerricans*

Strong outer packagings

See paragraph 5.1.15 of this report:

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".

APPENDIX B

PROPOSED ADDITION OF PROVISIONS FOR THE CARRIAGE OF DANGEROUS GOODS ON HELICOPTERS IN THE TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR

Part 1

GENERAL

Chapter 1

SCOPE AND APPLICABILITY

...

See paragraph 5.3.1 of this report:

1.1 GENERAL APPLICABILITY

1.1.1 These *Technical Instructions for the Safe Transport of Dangerous Goods by Air*, referred to herein as the "Instructions", prescribe the detailed requirements applicable to the international civil transport of dangerous goods by air by any aircraft (including both internal and external carriage). Any addenda to this edition of the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air* issued by ICAO constitute part of these Instructions.

...

1.1.4 For the State of overflight, if none of the criteria for granting an exemption are relevant, an exemption may be granted based solely on whether it is believed that an equivalent level of safety in air transport has been achieved.

...

Note 5.— Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, some additional considerations need to be made when dangerous goods are carried by helicopter, as described in 7.7.

1.1.4.5 General exceptions

1.1.4.5.1 Except for 7.4.2, these Instructions do not apply to dangerous goods carried ~~on~~ by an aircraft where the dangerous goods are:

...

- c) for dropping in connection with agricultural, horticultural, forestry, avalanche control or pollution control activities;

Renumber paragraphs 1.1.4.2, 1.1.4.3 and 1.1.4.4 accordingly.

...

Chapter 3

GENERAL INFORMATION

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

3.1 DEFINITIONS

...

External carriage. Any load suspended from a helicopter or in equipment attached to a helicopter.

...

Part 4

PACKING INSTRUCTIONS

INTRODUCTORY NOTES

...

Note 11.— Open external carriage

When dangerous goods are prepared for open external carriage (e.g. suspended from a helicopter or in open external carrying devices), consideration should be given to the type of packaging used and protection of those packagings where necessary from the effects of airflow and weather (e.g. by damage from rain or snow).

...

Part 7

OPERATOR'S RESPONSIBILITIES

Chapter 1

ACCEPTANCE PROCEDURES

...

Chapter 2

STORAGE AND LOADING

...

2.1.3 For additional requirements concerning the loading of dangerous goods for carriage by helicopters, see Part 7;7.

...

...

2.4 LOADING AND SECURING OF DANGEROUS GOODS

2.4.1 Loading ~~on~~ of cargo aircraft

...

2.4.1.1 Packages or overpacks of dangerous goods bearing the "Cargo aircraft only" label must be loaded ~~on~~ for carriage by a cargo aircraft in accordance with one of the following provisions:

- a) in a Class C aircraft cargo compartment; or
- b) in a unit load device equipped with a fire detection/suppression system equivalent to that required by the certification requirements of a Class C aircraft cargo compartment as determined by the appropriate national authority (a ULD that is determined by the appropriate national authority to meet the Class C aircraft cargo compartment standards must include "Class C compartment" on the ULD tag); or
- c) in such a manner that in the event of an emergency involving such packages or overpacks, a crew member or other authorized person can access those packages or overpacks, and can handle and, where size and mass permit, separate such packages or overpacks from other cargo; or
- d) external carriage by a helicopter; or
- e) with the approval of the State of the Operator, for helicopter operations, in the cabin (see Part S-7:2.4 of the Supplement).

...

Chapter 4

PROVISION OF INFORMATION

4.1 INFORMATION TO THE PILOT-IN-COMMAND

See paragraph 3.5.11 of DGP/23-WP/2 and paragraph 5.5.1 of this report:

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~~ the operator of an aircraft in which dangerous goods are to be carried must:

- a) provide the pilot-in-command, ~~as early as practicable before departure of the aircraft,~~ 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.

See paragraph 5.3.1 of this report:

For helicopter operations, with the approval of the State of the Operator, the notification to the pilot-in-command may be abbreviated or be by other means (e.g. radio communication, as part of the working flight documentation such as a journey log or operational flight plan) where circumstances make it impractical to produce written or printed information or on a dedicated form (see Part S-7:4.8 of the Supplement).

See paragraph 5.5.1 of this report:

Note 1.— This includes information about dangerous goods loaded at a previous departure point and which are to be carried on a subsequent flight.

Note 2.— Information required under 4.1.1 b) should be readily available to the operator's personnel whose responsibilities most closely align with the duties of the flight operations officer/flight dispatcher described in Annex 6, Part I, Chapter 4.6. These personnel are intended to provide the information required by Part 7.4.6 to facilitate emergency response.

Note 3.— The provision in 4.1.1 b) is recommended until 1 January 2014 when it will become mandatory.

...

See paragraph 5.3.1 of this report:

4.84.9 EMERGENCY RESPONSE INFORMATION

The operator must ensure that for consignments for which a dangerous goods transport document is required by these Instructions, appropriate information is immediately available at all times for use in emergency response to accidents and incidents involving dangerous goods in air transport. The information must be available to the pilot-in-command and can be provided by:

- a) the ICAO document *Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods* (Doc 9481); or
- b) any other document which provides ~~similar~~ appropriate information concerning the dangerous goods on board.

...

Chapter 7

HELICOPTER OPERATIONS

Note.— The requirements in this chapter are in addition to the other provisions of the Technical Instructions that apply to all operators (e.g. Part 7 and Part 1.4).

7.1.1 Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, there may be circumstances when the full provisions of the Technical Instructions are not appropriate or necessary, due to the operations involving un-manned sites, remote locations, mountainous areas or construction sites etc. In such circumstances and when appropriate, the State of the Operator may grant an approval in order to permit the carriage of dangerous goods without all of the normal requirements of the Technical Instructions being fulfilled. When States other than the State of the Operator have notified ICAO that they require prior approval of such operations, approval must also be obtained from the States of Origin and destination, as appropriate.

7.1.2 When loading dangerous goods for open external carriage by a helicopter, consideration should also be given to the type of packaging used and to the protection of those packagings, where necessary, from the effects of airflow and weather (e.g. by damage from rain or snow), in addition to the general loading provisions of 7.2.

7.1.3 When dangerous goods are carried suspended from a helicopter, the operator must ensure that consideration is given to the dangers of static discharge upon landing or release of the load.

7.1.4 When helicopters are carrying passengers, in accordance with Part S-7.2.2.4 of the Supplement, the State of the Operator may grant an approval to permit the carriage of dangerous goods either:

- a) in the cabin, when those dangerous goods are associated with and accompanied by the passengers; or
- b) in cargo compartments that do not meet the requirements of Part 7.2.1.1.

— — — — —

APPENDIX C

PROPOSED ADDITION OF PROVISIONS FOR THE CARRIAGE OF DANGEROUS GOODS ON HELICOPTERS IN SUPPLEMENT TO THE TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR

Part S-7

STATE'S RESPONSIBILITIES

...

Chapter 2

STORAGE AND LOADING

...

2.2 LOADING ON PASSENGER AIRCRAFT

...

2.2.3 Where a packing group is assigned, the dangerous goods in 2.2.2 are restricted to those in Packing Group III only.

See paragraph 5.3.1 of this report:

2.2.4 For helicopter operations, the State of the Operator may approve the carriage of dangerous goods permitted for carriage on a passenger aircraft other than those in 2.2.2 and 2.2.3. When such an approval is to be granted, States should consider the factors that may mean carriage within the cabin is required or preferable such as the size/mass of packages making it impractical to carry them as an external load, accessibility to the packages and duration of the flight. When States other than the State of the Operator have notified ICAO that they require prior approval of such operations, approval must also be obtained from the States of origin and destination, as appropriate.

...

2.4 CARRIAGE OF CARGO AIRCRAFT ONLY DANGEROUS GOODS BY HELICOPTERS IN THE CABIN

2.4.1 Packages bearing the "Cargo aircraft only" label may be carried in the cabin of a helicopter operating as a cargo aircraft, with the approval of the State of the Operator.

2.4.2 When granting such an approval, States should consider:

a) the types and quantity of dangerous goods involved;

b) the types of packaging used;

c) the duration of the flight(s);

d) the types of operation; and

e) the ability to land quickly in the event of an emergency, etc.

...

Chapter 4

PROVISION OF INFORMATION

4.8 INFORMATION TO THE PILOT-IN-COMMAND FOR HELICOPTER OPERATIONS

4.8.1 Part 7:4.1.1 of the Technical Instructions provides that, with the approval of State of the Operator, where circumstances make it impractical to produce written or printed information or on a dedicated form, the notification to the pilot-in-command may be abbreviated or be by other means (e.g. radio communication, as part of the working flight documentation such as a journey log or operational flight plan etc). Examples of such circumstances include:

- a) when the helicopter does not land in order to pick up the dangerous goods such that it is not possible to provide written information at that location;
- b) where the helicopter is in-flight and the planned load is changed prior to being picked up without the helicopter landing;
- c) when short, repetitive flights or a series of flights from different locations are undertaken by a helicopter where it is impractical to provide separate written information for each flight;
- d) where dangerous goods are picked up from an un-manned site.

4.8.2 When granting such an approval, States should consider all of the circumstances under which the approval is being sought, the minimum information that should be provided to the pilot-in-command and the procedures that the operator would implement to ensure that the information is provided and recorded.

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APPENDIX D

**PROPOSED AMENDMENTS TO PROVISIONS RELATED TO
NOTIFICATION TO THE PILOT-IN-COMMAND PROVISIONS IN THE
TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF
DANGEROUS GOODS BY AIR**

Part 7

OPERATOR'S RESPONSIBILITIES

...

Chapter 4

PROVISION OF INFORMATION

4.1 INFORMATION TO THE PILOT-IN-COMMAND

See paragraph 3.5.11 of DGP/23-WP/2 and paragraph 5.5.1 of this report:

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~~ the operator of an aircraft in which dangerous goods are to be carried must:

- a) ~~provide~~ the pilot-in-command ~~as early as practicable before departure of the aircraft~~, 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.

...

Note 1.— This includes information about dangerous goods loaded at a previous departure point and which are to be carried on a subsequent flight.

Note 2.— Information required under 4.1.1 b) should be readily available to the operator's personnel whose responsibilities most closely align with the duties of the flight operations officer/flight dispatcher described in Annex 6, Part I, Chapter 4.6. These personnel are intended to provide the information required by Part 7.4.6 to facilitate emergency response.

Note 3.— The provision in 4.1.1 b) is recommended until 1 January 2014 when it will become mandatory.

...

4.1.7 A legible copy of the information provided to the pilot-in-command must be retained on the ground. This copy must have an indication on it, or with it, that the pilot-in-command has received the information. ~~This~~ A copy, or the information contained in ~~it~~ the notice-to-the pilot-in-command, must be readily accessible to the ~~aerodromes of last departure and next scheduled arrival point, until after the flight to which the information refers~~ flight operations officer, flight dispatcher, or designated ground personnel responsible for flight operations until after the arrival of the flight.

APPENDIX E

**COMPETENCY-BASED TRAINING AND ASSESSMENT FOR
DANGEROUS GOODS PERSONNEL**

Add the following new section 4.4 to Part 1, Chapter 4 (Training) of the Technical Instructions:

Part 1

GENERAL

...

Chapter 4

TRAINING

...

See paragraph 5.7.1 of this report:

4.4 COMPETENCY-BASED TRAINING AND ASSESSMENT

Competency-based training and assessment should be used in accordance with the general provisions contained in Chapter 2 of the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868).

ATTACHMENT A

COMPETENCY FRAMEWORK FOR STATE EMPLOYEES INVOLVED IN THE
REGULATION AND OVERSIGHT OF TRANSPORT OF DANGEROUS GOODS BY AIR

See paragraph 5.7.1 of this report:

1.1 INTRODUCTION

1.1.1 The objective of this chapter is to provide guidance to States in implementing competency-based training and assessment for personnel engaged in policies, regulation, inspection and supervision of work related to the transport of dangerous goods by air. It includes a competency framework for the uniform implementation of training and assessment required for State employees who must ensure compliance with their State's obligations and with Annex 18 — *The Safe Transport of Dangerous Goods by Air*.

1.1.2 It is noted that States use a variety of systems to exercise safety oversight in the transport of dangerous goods by air. ICAO's safety oversight audits have identified discrepancies among States in their inspectors' performance standards and in the implementation of their respective civil aviation dangerous goods programmes. For example, one State may have a clearly-defined process for the approval of dangerous goods training programmes while another may not. Applying a common competency framework would result in harmonized performance standards of State employees.

1.1.3 A generic competency framework for State employees is at Attachment I to this chapter. This competency framework reflects safety-critical tasks and, when applied, will have a positive impact on specific dangerous goods functions and the ability of individuals to perform their jobs successfully and to the required standards. Each State must provide specific training for these functions to each of its employees involved in policy making, regulation and oversight of compliance of dangerous goods transported by air.

1.2 TERMINOLOGY

For the purpose of this chapter, the following terminology applies:

Air operator certificate. A certificate authorizing an operator to carry out specified civil air transport operations.

Competency. A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

Competency-based training and assessment. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

Competency element. An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

Competency unit. A discrete function consisting of a number of competency elements.

Dangerous goods. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Inspection method. Techniques that are used during the course of evaluating compliance with relevant regulations. The inspection methods include:

- a) observation: visually observing the performance of regulatory requirements for compliance with relevant regulations;
- b) interview: a technique by which questions or discussions with persons performing transportation functions are used to gather information concerning the transportation of dangerous goods;
- c) document review: reviewing paper or electronic records to determine whether required documents are properly prepared, contain accurate information, and maintained as required by the regulations;
- d) verification: using third party information to independently confirm whether regulatory requirements are being met; and
- e) procedure evaluation: ensuring appropriate written procedures, addressing all regulated activities undertaken, are in place.

Operations manual. A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Performance criteria. Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

Shipper. A person, organization or enterprise undertaking any of the shipper's responsibilities of Part 5 of the Technical Instructions.

COMPETENCY FRAMEWORK FOR STATE EMPLOYEES

1. SCOPE OF THE COMPETENCY FRAMEWORK

The scope of the competency framework concerns State employees involved in the regulation and oversight of the transport of dangerous goods by air based on obligations of States according to the Convention on International Civil Aviation:

- a) the State is responsible for implementing a system for determining compliance with Annex 18;
- b) the application of the basic principles of a competency-based approach determines the performance level for State employees in carrying out their function to meet the State's obligations as defined by the Annex 18;

The competency framework has taken into account the "ICAO Safety Oversight Transport of Dangerous Goods Audit Checklist", itemizing the separate civil aviation dangerous goods programme activities required by a State:

- a) conduct initial review and approval of an operation manual and training programme on dangerous goods within the approval procedures for the AOC;
- b) conduct initial inspection of new operator or operator that intends to commence carriage of dangerous goods;
- c) conduct periodic inspection of the operator;
- d) conduct an ad-hoc inspection on dangerous shipping and handling procedures
- e) conduct an investigation on dangerous goods incidents and dangerous goods occurrences resulting from violations of the dangerous goods regulations;
- f) conduct a review of a revised operation manual on dangerous goods within the approval procedures for the AOC;
- g) conduct a review of a revised training programme for approval;
- h) conduct periodic inspection of shippers; and
- i) ensure that technical equipment required for inspection is being maintained and/or calibrated.

These activities have been included in the competency framework.

The details of the competency framework are based on common practices as applied by a number of States on training, operational procedures for inspection, surveillance and enforcement.

2. STRUCTURE OF THE DOCUMENT

Distinction is made between competencies of a "general nature" which are applicable to all State employees and competencies related to the actual "technical performance" of a State employee in relation to their specific tasks.

For task-related competencies, the basic competency framework is structured according to three levels defined in the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868): competency units, competency elements, and performance criteria. Further detailing at these three levels is derived from job and task analyses of common practices in some States.

Regarding the responsibilities of State employees and the principles applicable to the definition of the competency framework, distinction has been made between different functional levels: strategic, managerial and operational.

Taking into account the above, the competency framework for State employees is based on:

- a) Core competencies applicable to all State employees:
 - core competencies and personal attributes; and
 - general awareness, knowledge and skills;
- b) Competency units related to specific activities of State employees:

- establishing and maintaining dangerous goods oversight programmes;
- conducting inspections for the certification/approval of an operator;
- conducting inspections of operators;
- conducting Inspections of dangerous goods shipper; and
- conduct investigations,

3. CORE COMPETENCIES APPLICABLE TO ALL STATE EMPLOYEES

Core competencies have not yet been identified for State employees. This will be done once the work of the Next Generation of Aviation Professionals Task Force progresses its work and provides a standardized basis from which to work.

5. COMPETENCIES RELATED TO SPECIFIC ACTIVITIES OF STATE EMPLOYEES

Dangerous goods are articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions. The transport of dangerous goods is recognized as an integral part of a State's overall safety oversight programme. Each State must provide training to each of its dangerous goods employees which emphasizes a State's specific dangerous goods standards and regulations. Training should be designed so that it enables all State employees involved in dangerous goods oversight to perform their tasks. In the same manner in which States require industries performing dangerous goods related functions to be trained in the transport of dangerous goods, States should provide their employees with training commensurate with their responsibilities. Table S-1-1 identifies competencies related to the specific activities conducted by dangerous goods State employees.

Table S-1-1. Competency units, competency elements and performance criteria related to specific activities of State employees

<i>Competency element</i>	<i>Performance criteria</i>	<i>Reference</i>
1. Competency unit: Establish and maintain dangerous goods oversight programme		
Each State shall take the necessary measures to achieve compliance with Annex 18 and the detailed provisions contained in the Technical Instructions.		
The competency elements and related performance criteria at regulatory, policy and management level are as follows:		
Promulgate and maintain dangerous goods regulations	<ul style="list-style-type: none"> — ensure national dangerous goods regulations are complete and up-to-date — establish exemption and approval procedures — establish procedures for approving operations specifications for the transport of dangerous goods — establish regulations for oversight of shippers of dangerous goods — establish regulations for oversight of operators for dangerous goods responsibilities — participate with international rule making bodies as appropriate to support national safety programme — Initiate amendments to national dangerous goods regulations to implement changes to Standards and Recommended Practices (SARPs) and regulations. 	Annex 18, paragraph 2.7: National authority Each Contracting State shall designate and specify to ICAO an appropriate authority within its administration to be responsible for ensuring compliance with this Annex.

<i>Competency element</i>	<i>Performance criteria</i>	<i>Reference</i>
Establish and maintain dangerous goods oversight programmes	<ul style="list-style-type: none"> — develop dangerous goods programme policy process — develop risk-based inspection programme — establish inspection procedures and process — develop, implement and maintain inspection protocols and tools — develop compliance and enforcement programme and process — develop a framework for an education programme which includes response to public requests for advice and guidance — support dangerous goods related research and development — develop, implement and maintain initial and recurrent training programme for dangerous goods personnel — develop and maintain performance plans and objectives for dangerous goods personnel — develop and maintain occupational safety programme 	
Conduct planning and organization	<ul style="list-style-type: none"> — coordinate inspections programme — establish priorities (risk-based approach) — establish inspection procedures — establish exemption and approval procedures — coordinate input by staff into dangerous goods policies — develop a framework for an education programme and response to requests for advice and guidance 	<p>Annex 18 Paragraph 2.1: “...States concerned may grant an exemption from the provisions of the Technical Instructions...”</p> <p>Paragraph 2.5 Notification of variations from the Technical Instructions</p>
Special operations	<ul style="list-style-type: none"> — exercise sound judgment in granting of exemptions and approvals — determine suitability of an operator or shipper to be granted an exemption or approval — use judgment to detain an aircraft when appropriate 	<p>Annex 18 Paragraph 2.2.1: Each Contracting State shall take the necessary measures to achieve compliance with the detailed provisions contained in the Technical Instructions.</p>

2. Competency unit: Conduct inspection for certification/approval of an operator

An operator engaged in commercial operations needs an air operators certificate (AOC) issued by the State of the Operator. The AOC certification process for all operators includes elements related to dangerous goods (e.g. approval of training programmes and operations manual) to minimize the likelihood of safety being compromised by non-compliance with the requirements. Operators who wish to carry dangerous goods as cargo are subject to additional authorization, which is dependent on enhanced operational manuals and training programmes with adequate processes and procedures in place to ensure compliance with the requirements of the Technical Instructions.

Note.— Non-AOC operators are also subject to these requirements.

Review of the application and the operations manual	<p>Verify:</p> <ul style="list-style-type: none"> — the identification of the applicant (air operators, certificate and authorized operations/limitations) — completion of appropriate application forms — clarification of administrative details of the approval process — dangerous goods acceptance, handling, loading, inspection and transport procedures — dangerous goods documentation management — reporting procedures of dangerous goods incidents/accidents and undeclared or misdeclared dangerous goods — emergency response procedures during ground handling and notification to emergency services — emergency response guidance for incidents during flight and notification to ATC 	<p>Annex 6 Paragraph 4.2: Operational certification and supervision CAO audit checklist: Conduct an initial inspection of a new operator or an operator intending to commence carriage of dangerous goods.</p>
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Competency element	Performance criteria	Reference
	— adequacy and operation of the internal quality monitoring system to ensure compliance with the Technical Instructions	
Approve operations manual	— reviewing and approving the operations manual associated procedures and supporting documents	""
Inspect facilities	Conduct an inspection to verify: <ul style="list-style-type: none"> — the application by the operator's staff of the dangerous goods procedures for acceptance, handling, loading, inspection and transport — familiarization of the operator's staff accepting and handling the dangerous goods consignments and associated documents 	Technical Instructions Chapter 7: Operators responsibilities
Evaluate and approve training programmes	<ul style="list-style-type: none"> — assess the operator's initial and recurrent training programme for aircrew, employees and agents against the requirements of the Technical Instructions — assess the program's continuous evaluation and update process as appropriate due to changes in the Technical Instructions, operations manual and dangerous goods procedures — assess the dangerous goods instructor's qualification against TI requirements 	Technical Instructions Paragraph 4.1: Establishment of training programmes Paragraph 4.1.2: Review by State authorities
Provide recommendation report	Provide a recommendation for issuing certificate/approval	

3. Competency unit: Conduct Inspection of an Operator

A State must inspect operators as part of routine surveillance and/or based upon non-compliance, trend analysis or safety concerns.

Note.— Inspections may take place at facilities located on or off the airport and at those entities acting on behalf of the operator.

For each of the following competency elements and performance criteria, the inspector will utilize the applicable inspection method.

Conduct pre-inspection process	<ul style="list-style-type: none"> — collect information on dangerous goods-related activities of an Operator — analyze information on dangerous goods related activities of an Operator — organize inspection activities 	Annex 18 Paragraph 11.1: Inspection systems: Each Contracting State shall establish inspection, surveillance and enforcement procedures with a view to achieving compliance with its dangerous goods regulations. Annex 18 Chapter 8: Operators responsibilities
Conduct inspection process	<ul style="list-style-type: none"> — conduct opening briefing — evaluate compliance with: <ul style="list-style-type: none"> — shipping and transporting aircraft spares and their replacements <i>Note.— A shipper inspection is to be conducted on such activity.</i> <ul style="list-style-type: none"> — limitation of dangerous goods on aircraft — general applicability — acceptance procedure requirements 	""

Competency element	Performance criteria	Reference
	<ul style="list-style-type: none"> — storage and loading requirements — inspection and decontamination requirements — provision of information requirements — provisions concerning passengers and crew — provisions for dangerous goods carried by passengers and crew — Provisions to aid recognition of undeclared dangerous goods — Conduct closing briefing 	
Conduct post inspection process	<ul style="list-style-type: none"> — Record inspection result — Determine follow up action 	""

4. Competency unit: Conduct Inspection of Dangerous Goods Shipper

A State must inspect shippers as part of routine surveillance and/or based upon non-compliance, trend analysis or safety concerns. A shipper may be an individual person (e.g. sending a package via a courier company) or a large company (e.g. chemical supplier, operator, repair station or freight forwarder shipping dangerous goods).

For each of the following competency elements and performance criteria, the inspector will utilize the applicable inspection method.

Conduct pre-inspection process	<ul style="list-style-type: none"> — collect information on dangerous goods activities of shipper — analyze information on dangerous goods activities of shipper — organize inspection activities 	<p>Annex 18 Paragraph 11.1 Inspection systems: Each Contracting State shall establish inspection, surveillance and enforcement procedures with a view to achieving compliance with its dangerous goods regulations.</p> <p>Annex 18 Chapter 7 Shippers responsibilities</p> <p>ICAO audit checklist: Conduct an ad-hoc assessment on dangerous shipping and handling procedures of operators</p>
Conduct inspection process	<ul style="list-style-type: none"> — conduct opening briefing — evaluate compliance with: <ul style="list-style-type: none"> — provision of information to employees requirements — training requirements — classification requirements — documentation requirements — packaging requirements — labeling requirements — marking requirements — unit load device loading requirements, as applicable — conduct closing briefing 	""
Conduct post inspection process	<ul style="list-style-type: none"> — record inspection result — determine follow-up action 	""

5. Competency unit: Conduct Investigation

With the aim of preventing the recurrence of non-compliances with the Technical Instructions which occur in its territory and which involve the transport of dangerous goods originating in or destined for another State, States must establish procedures for the investigation of:

- dangerous goods accidents;
- dangerous goods incidents;
- discoveries of undeclared or mis-declared dangerous goods; and
- discoveries of dangerous goods in baggage which are not permitted

As part of a State's enforcement obligation, procedures must also be established for the investigation of other non-compliances (e.g. when discovered during an inspection).

The competency elements and related performance criteria are defined as follows:

Conduct pre-investigation process	<ul style="list-style-type: none"> — collect information on dangerous goods related activities of an operator — analyze information on dangerous goods related activities of an operator — analyze event against regulatory framework — organize investigation — identify resources required 	<p>Annex 18 Paragraph 12.1: Contracting State shall establish procedures for investigating and compiling Information of dangerous goods incidents.</p> <p>ICAO audit checklist: Conduct an investigation on dangerous goods incidents and dangerous goods occurrences resulting from violations of the dangerous goods regulations;</p> <p>Annex 18 Paragraph 9.6: Provision of information in event of an aircraft accident or incident</p>
Conduct investigation process	<ul style="list-style-type: none"> — conduct interviews — collect evidence — assess evidence — document investigation — recommend corrective action 	""

— — — — —

ATTACHMENT B

**COMPETENCY-BASED TRAINING AND ASSESSMENT FOR
PERSONNEL OF ORGANISATIONS ENGAGED IN OFFERING
DANGEROUS GOOD FOR TRANSPORT BY AIR AND/OR PROVIDING
SERVICES FOR ARRANGING SUCH TRANSPORT**

See paragraph 5.7.1 of this report:

1 INTRODUCTION

1.1.1 The objective of ICAO in publishing this document is to provide guidance to Contracting States, to implement competency-based training and assessment for personnel of organizations engaged in offering dangerous goods for transport by air and/or providing services for arranging such transport. This document has been prepared by the Dangerous Goods Panel (DGP). It includes a basic competency framework for the uniform implementation of training required for Shippers to ensure compliance with their obligations with respect to Annex 18 — *The Safe Transport of Dangerous Goods by Air* and the detailed specifications in the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284). Requirements for the establishment of training programmes for employees engaged in the transport of dangerous goods, having a safety critical function, are contained in the Technical Instructions, Part 1, Chapter 4.

1.1.3 In order to harmonize performance standards of shippers, there is a need to develop a generic competency framework for their employees involved in preparing dangerous good to be offered for transport by air. In turn, this will have a positive impact on the specific employee's function and the ability of the individual to perform the job successfully to the required standards. Whether or not a person is categorized as a shipper is determined by the tasks they perform.

2. TERMINOLOGY

For the purpose of this document, the following terminology applies:

Air operator certificate. A certificate authorizing an operator to carry out specified civil air transport operations.

Appropriate national authority. Any authority designated, or otherwise recognized, by a State to perform specific functions related to Annex 18 or the Technical Instructions.

Cargo aircraft. Any aircraft, other than a passenger aircraft, which is carrying goods or property.

Competency. A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

Competency-based training and assessment. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

Competency element. An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

Competency unit. A discrete function consisting of a number of competency elements.

Consignment. One or more packages of dangerous goods accepted by an operator from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address.

Dangerous goods. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Dangerous goods accident. An occurrence associated with and related to the transport of dangerous goods by air which results in fatal or serious injury to a person or major property or environmental damage.

Dangerous goods incident. An occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods by air, not necessarily occurring on board an aircraft, which results in injury to a person, property or environmental damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to be a dangerous goods incident.

Freight forwarder. A person or organization who offers the service of arranging the transport of cargo by air.

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Overpack. An enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage.

Package. The complete product of the packing operation, consisting of the packaging and its contents prepared for transport.

Packaging. One or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions.

Performance criteria. Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

Shipper. For the purpose of this document, a person, organization or enterprise undertaking any of the shipper's responsibilities of Part 5 of the Technical Instructions.

Technical Instructions. The *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284), approved and issued periodically in accordance with the procedure established by the ICAO Council.

Unit load device. Any type of freight container, aircraft container, aircraft pallet with a net or aircraft pallet with a net over an igloo.

3. SCOPE OF THE COMPETENCY FRAMEWORK

The scope of the competency framework concerns the responsibilities of shippers involved in the preparation of dangerous goods for transport by air in accordance to the Convention on International Civil Aviation:

- The State is responsible to implement an oversight system to determine compliance with Annex 18;
- The application of the basic principles for a competency-based approach determines the performance level for employees of shippers in carrying out their safety critical function to meet their obligations as defined by Annex 18.

The details of the competency framework are based on common practices as applied by States on training, operational procedures, safety oversight.

4. STRUCTURE OF THE DOCUMENT

The basic structure of the competency framework consists of three levels, as applied by ICAO in other aviation areas (definition: see chapter 2):

- a) competency units;
- b) competency elements; and
- c) performance criteria.

Further detailing at these three levels is derived from the relevant shippers' responsibilities at operational and management levels, and the analysis of related tasks as implemented by States. Responsibilities or tasks shippers actually perform will determine which competency elements apply.

Taking into account the above, the competency framework for shippers is based on the following:

- a) Core competencies applicable to all shippers:
 - core competencies and personal attributes; and
 - general awareness, knowledge and skills;
- b) Competency units related to specific activities of shippers:
 - perform pre-packaging assessment of shipment;
 - pack dangerous goods;
 - apply all consignment procedures; and
 - respond to requests.

4a. CORE COMPETENCIES APPLICABLE TO ALL SHIPPERS

Core competencies have not yet been identified for shippers in this document. This will be done once the work of the Next Generation of Aviation Professionals Task Force progresses its work and provides a standardized basis from which to work.

5. COMPETENCIES RELATED TO SPECIFIC ACTIVITIES OF A SHIPPER

A shipper is identified as an entity which offers dangerous goods for commercial air transportation service. The shipper's responsibility, however, may be assigned to an entity which performs tasks or causes a dangerous goods shipment to be offered for transport on the behalf of a third party. It is the shipper's responsibility to ensure that all of the relevant air transport requirements are applied.

Shippers shall take the necessary measures to achieve compliance with Annex 18 and the detailed provisions contained in the Technical Instructions. Before a consignment of dangerous goods is offered for air transport, all relevant persons involved in its preparation must have received training to enable them to carry out their responsibilities.

The transport of dangerous goods is recognized as an integral part of a State's overall safety oversight program. Personnel must be trained in the requirements commensurate with their responsibilities. Training should be designed so that it enables all personnel involved in the transport of dangerous goods to perform their tasks.

A training programme must be established and maintained which incorporates the general provisions for competency-based training and assessment described in Chapter 2 of the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868). The programme must at least include procedures, which enable the shipping organization to:

- determine the training needs for each employee;
- develop in-house and/or verify external training programme;
- ensure initial and recurrent training is provided on time;
- maintain training records; and
- on-the-job training.

There are references to alleviations from the full requirements of the Technical Instructions throughout this framework. It should be noted that shippers are not required to apply these alleviations; they may chose to comply with the full requirements.

The following paragraphs are intended to identify competencies related to the specific activities conducted by dangerous goods shippers at an operational level.

5.1 Competency unit: Perform pre-packaging assessment of shipment

<i>Competency element</i>	<i>Performance criteria</i>
Classify dangerous goods	<ul style="list-style-type: none"> — determine if an article or substance is listed by name in Table 3-1 and if it is, use information provided — if an article or substance is not listed by name in Table 3-1, classify the article or substance according to the class definition and test criteria and, when applicable, assign the appropriate packing group — determine the class of a substance, mixture or solution having more than one risk and which is not listed by means of the precedence of hazard table — if an article or substance is not listed by name and meets the classification criteria, assign the correct UN number and proper shipping name — verify provided classification information if shipper is not also the manufacturer
Assess restrictions	<ul style="list-style-type: none"> — determine if the article or substance is forbidden — ensure no dangerous goods are transported by post, with the exception of those permitted by the post in the Technical Instructions — apply procedures for exemptions or approvals when applicable

5.2 Pack dangerous goods

<i>Competency element</i>	<i>Performance criteria</i>
Determine packing method	<ul style="list-style-type: none"> — determine whether standard, excepted or limited quantity provisions are permitted — identify any restrictions which apply to the packing methods — identify most appropriate packing method
Apply all relevant packing requirements	<ul style="list-style-type: none"> — select appropriate packaging — ensure measures have been taken to ensure packagings used are compatible with dangerous goods — respect inner packaging quantity limits and maximum quantity per package limits — ensure all applicable packing instruction requirements are met — apply specific air packing requirements such as closures, absorbent material, etc. — when a reused package is used, verify that all packing requirements are complied with — when an overpack is used, verify that all requirements are complied with — when different dangerous goods are packed together, verify that all provisions have been complied with
Ensure only packagings that are properly tested are used	<ul style="list-style-type: none"> — ensure packages have been tested in accordance with the requirements for the specific articles or substances — ensure articles or substances are packaged in the configuration as specified in the test certificate

5.3 Apply all consignment procedures

<i>Competency element</i>	<i>Performance criteria</i>
Notify competent authority	<ul style="list-style-type: none"> — notify competent authority if required by approval or exemption — notify competent authority for Class 7 shipments
Apply markings	<ul style="list-style-type: none"> — verify if correct UN specification marking has been applied to package — mark package or overpack with the proper shipping name, UN number, address of shipper and consignee and any applicable additional marking as required by the Technical Instructions
Apply labels	<ul style="list-style-type: none"> — affix or apply applicable hazard labels to package or overpack — affix or apply applicable handling labels to package or overpack
Prepare documentation	<ul style="list-style-type: none"> — complete and sign dangerous goods transport document — produce supplemental documentation when required

5.4 Respond to requests

<i>Competency element</i>	<i>Performance criteria</i>
Provide information to competent authority upon request	<ul style="list-style-type: none"> — demonstrate an understanding of the requirement to produce information to an appropriate national authority upon request, e.g. measures which have been taken to ensure compatibility, test certificates, training records etc.
Provide emergency information to emergency responders information to personnel	<ul style="list-style-type: none"> — demonstrate capability to provide information to emergency responders upon request — locate information in shipping organization's database and records in a timely manner — describe consequences of incidents and accidents

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ATTACHMENT C**COMPETENCY FRAMEWORK FOR FREIGHT FORWARDERS**

See paragraph 5.7.1 of this report:

1. INTRODUCTION

1.1.1 The objective of ICAO in publishing this document is to provide guidance to freight forwarders to implement competency-based training and/or assessment for personnel who perform specific functions related to the transport of dangerous goods by air. The overall objective of this generic competency framework is to harmonize the performance standards of Freight Forwarders and enhance the ability of the individual employee to perform the job in accordance with the requirements in Annex 18 and the Technical Instructions.

2. TERMINOLOGY

For the purpose of this document, the following terminology applies:

Air operator certificate. A certificate authorizing an operator to carry out specified civil air transport operations.

Appropriate national authority. Any authority designated, or otherwise recognized, by a State to perform specific functions related to Annex 18 or the Technical Instructions.

Cargo aircraft. Any aircraft, other than a passenger aircraft, which is carrying goods or property.

Competency. A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

Competency-based training and assessment. Training and assessment that are characterized by a performance orientation, emphasis on standards of performance and their measurement, and the development of training to the specified performance standards.

Competency element. An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

Competency unit. A discrete function consisting of a number of competency elements.

Consignment. One or more packages of dangerous goods accepted by an operator from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address.

Dangerous goods. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Dangerous goods accident. An occurrence associated with and related to the transport of dangerous goods by air which results in fatal or serious injury to a person or major property or environmental damage.

Dangerous goods incident. An occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods by air, not necessarily occurring on board an aircraft, which results in injury to a person, property or environmental damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to be a dangerous goods incident.

Freight forwarder. A person or organization who offers the service of arranging the transport of cargo by air.

Operations manual. A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operator. A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Overpack. An enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage.

Package. The complete product of the packing operation, consisting of the packaging and its contents prepared for transport.

Packaging. One or more receptacles and any other components or materials necessary for the receptacles to perform their containment and other safety functions.

Passenger aircraft. An aircraft that carries any person other than a crew member, an operator's employee in an official capacity, an authorized representative of an appropriate national authority or a person accompanying a consignment or other cargo.

Performance criteria. Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

Shipper. A person, organization or enterprise undertaking any of the shipper's responsibilities of Part 5 of the Technical Instructions.

Unit load device. Any type of freight container, aircraft container, aircraft pallet with a net or aircraft pallet with a net over an igloo.

3. SCOPE OF THE COMPETENCY FRAMEWORK

The scope of the competence framework of Freight Forwarders concerns specific functions related to the transport of dangerous goods by air that will be carried out under contract with the Shipper. The ICAO Annex 18 and the Technical Instructions defines the responsibilities of the Shipper and the Operator and does not address the Freight Forwarder's functions specifically apart from the training requirements. A freight forwarder is the logistic link between the shipper and the operator and may perform some specific functions related to the transport of dangerous goods by air, notwithstanding the own responsibilities of the shipper and the operator. The freight forwarder specifically facilitates, advises and may transport the shipments to the operator. Therefore the freight forwarder must at least be trained according to the Technical Instructions. However if he performs functions as a shipper and/or an operator he must also be trained in accordance with the competency framework of the shipper and/or the operator.

4. STRUCTURE OF THE DOCUMENT

The basic structure of the competency framework consists of three levels, as applied by ICAO in other aviation areas (definition: see chapter 2):

- a) competency units;
- b) competency elements; and
- c) performance criteria.

Further detailing at these three levels has been derived from the shippers and operators responsibilities relevant for freight forwarders at operational level and the analysis of related tasks as implemented by States.

Taking into account the above, the competency framework for freight forwarders is based on the following:

- a) Core competencies applicable to all freight forwarders:
 - core competencies and personal attributes; and
 - general awareness, knowledge and skills;
- b) Competency units related to specific activities of freight forwarders:
 - perform evaluation of the offered shipment;
 - verify offered package(s); and
 - verify and prepare documentation.

4a. CORE COMPETENCIES APPLICABLE TO ALL FREIGHT FORWARDERS

Core competencies have not yet been identified for freight forwarders in this document. This will be done once the work of the Next Generation of Aviation Professionals Task Force progresses its work and provides a standardized basis from which to work.

5. COMPETENCIES RELATED TO SPECIFIC ACTIVITIES OF A FREIGHT FORWARDER

A freight forwarder is identified as a person or organization who offers the service of arranging the transport of cargo by air. The services rendered by the Freight Forwarder are defined by either a contractual agreement or on an individual basis. According to Annex 18, it is the shipper's and operator's responsibility to ensure that all of the applicable air transport

requirements are met. Based on contractual obligations the freight forwarder shall take the necessary measures to achieve compliance with Annex 18 and the detailed provisions contained in the Technical Instructions. Before a consignment of dangerous goods is offered for air transport, all relevant persons involved in its preparation must have received training to enable them to carry out their responsibilities.

The transport of dangerous goods is recognized as an integral part of a State's overall safety oversight program. Personnel must be trained in the requirements commensurate with their responsibilities. Training should be designed so that it enables all personnel involved in the transport of dangerous goods to perform their tasks.

A training programme must be established and maintained which incorporates the general provisions for competency-based training and assessment described in Chapter 2 of the *Procedures for Air Navigation Services — Training* (PANS-TRG, Doc 9868). The programme must at least include procedures, which enable the freight forwarders organization to:

- a) determine the training needs for each employee;
- b) develop in-house and/or verify external training programme;
- c) ensure initial and recurrent training is provided on time;
- d) maintain training records; and
- e) on-the-job training

It is assumed/understood that a freight forwarding organization will establish systems and procedures which enable it to comply with its responsibilities to respond to queries from the appropriate authority. This includes but is not limited to information systems, record-keeping, training records, etc.

The following paragraphs are intended to identify the competency elements and related performance criteria related to the specific activities conducted by freight forwarders involved in the transport of dangerous goods at an operational level.

5.1 Competency unit: Perform evaluation of the offered shipment

<i>Competency element</i>	<i>Performance criteria</i>
Verify correct identification of the shipment	<ul style="list-style-type: none"> — establish procedures to aid recognition of undeclared dangerous goods — determine if the offered shipment contains dangerous goods — if the shipment contains dangerous goods, verify if these articles or substances are properly classified
Assess restrictions	<ul style="list-style-type: none"> — verify if the article or substance is forbidden for transport — verify if article or substance is permitted on passenger aircraft and cargo aircraft or cargo aircraft only — verify when applicable if all required exemptions or approvals are obtained — verify availability of passenger aircraft or cargo aircraft — verify any additional restrictions imposed by state(s) and/or operator(s) variations — when the use of a ULD is desirable and permitted, ensure proper arrangements are made with the operator — apply specific procedures for dangerous goods in consolidations when applicable

5.2 Competency unit: Verification of the offered package(s)

<i>Competency element</i>	<i>Performance criteria</i>
Verify packaging.	<ul style="list-style-type: none"> — ensure whether selected packing method (standard, excepted or limited quantity) is permitted — check if packaging complies with applicable packing instructions — check if package is free from damage or leakage — check when applicable if package bears correct UN specification markings — when an overpack is used, check if all requirements are complied with — when different dangerous goods are packed together, verify that all provisions have been complied with
Verify applicable marking and labeling requirements.	<ul style="list-style-type: none"> — check if all required markings are properly applied — check if all required hazard labels are properly applied — check if all required handling labels are properly applied — ensure that the application of any additional labeling or marking doesn't cause confusion or obstruct the required dangerous goods labeling and marking

5.3 Verify and prepare documentation

<i>Competency element</i>	<i>Performance criteria</i>
Check provided documentation	<ul style="list-style-type: none"> — check if dangerous goods declaration is complete and correct — check whether the dangerous goods declaration is in accordance with the shipment — if applicable check validity of package design certificate and/or any other certificate for Class 7 — check any additional documents required by State and/or operator variation
Prepare documentation	<ul style="list-style-type: none"> — add required information related to dangerous goods on the air waybill if used

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Agenda Item 6: Other business**6.1 SAFETY IN AIR TRANSPORT OF PACKAGES
CONTAINING AN OXYGEN ENRICHED ATMOSPHERE
(DGP/23-WP/60)**

6.1.1 The panel was asked to consider whether the transport of large packages containing an oxygen enriched atmosphere could be transported safely, if they should be forbidden for transport, or if they should be classified as dangerous goods and permitted for transport in accordance with the Instructions. It was confirmed that the oxygen cylinder would be removed once the atmosphere was enriched and would not accompany the container during transport.

6.1.2 The panel concluded that since the oxygen would no longer be under pressure, these packages would not need to be classified as dangerous goods and could be transported safely.

**6.2 REVISION OF THE DANGEROUS GOODS PANEL —
GUIDANCE DOCUMENT (DGP/23-WP/73)**

6.2.1 The panel was presented with a draft new version of the *Guidance Material for the Panel* document. It was explained that the new version was based on some of the structure and content of the UN Subcommittee's *Guiding Principles for the Development of the UN Model Regulations*. It was felt that the guidance document would be a useful resource to aid panel members in preserving the reasons for decisions taken on matters of principle regarding the content of the Technical Instructions.

6.2.2 The panel extended its appreciation to the drafter of the guidance material. It was recognized that the guidance material would be a living document which would need to be maintained based on on-going changes to the Technical Instructions. It was agreed that the document would only be made available to the panel at this time.

**6.3 DANGEROUS GOODS REQUIREMENTS FOR ANNEX 6
BASED ON ANNEX 18 (DGP/23-WP/100)**

6.3.1 The meeting was briefed by the Secretary of the Operations Panel (OPSP) on work being carried out by that panel to strengthen the relationship between Annex 6 — *Operation of Aircraft* and Annex 18 requirements. The work was prompted by safety oversight audits which revealed that some civil aviation authorities were not aware of the scope of their operational responsibilities for oversight of dangerous goods activities, particularly in relation to packers, shippers and handlers.

6.3.2 The OPSP recognized the potential value in introducing dangerous goods oversight responsibility requirements into Annex 6 and recommended to the ANC that this work be undertaken. Accordingly, the ANC agreed to add a new task to the OPSP work programme entitled "Dangerous Goods Requirements for Annex 6". The work would be expanded under this task to other elements regarding the carriage of dangerous goods considered to be of operational significance, such as the involvement of flight dispatchers in the processing of emergency information.

6.3.3 The Thirteenth Meeting of the OPS Panel Working Group of the Whole (OPSP/WG/WHL/13) was held immediately prior to DGP/23 (3 to 7 October 2011). That meeting considered a proposal to add a new chapter to Annex 6, Part I based on Annex 18 and the Technical Instructions. This new chapter would provide a central location in Annex 6 for the dangerous goods requirements relevant both to the State of the Operator and to the operator.

6.3.4 OPSP noted that this could be a significant undertaking, and that a cooperative effort between the OPSP, the DGP and the Secretariat would be required to ensure success. OPSP agreed to form a Dangerous Goods Sub-Group (DGSG) to begin work on the proposal and welcomed the DGP's participation with the group. OPSP/WG/WHL/13 agreed that it would be important for both panels to determine the following:

- a) the definition and scope of the task;
- b) the terms of reference and work programme;
- c) the means of progressing the task; and
- d) a list of potential task elements, to include but not necessarily limited to:
 - 1) creation of a new chapter in Annex 6 (Chapter 14) to address operational requirements for dangerous goods;
 - 2) oversight by the appropriate authority of all aspects of the transport of dangerous goods by air, to specifically include packers, shippers and handlers, especially when the State did not approve any of its air operators to carry dangerous goods;
 - 3) identification of dangerous goods requirements for operators not approved to carry dangerous goods;
 - 4) approval of dangerous goods training programs for operators, including those not authorized to carry dangerous goods;
 - 5) approval of dangerous goods manuals or the dangerous goods section of the air operator's operations manual;
 - 6) carriage of dangerous goods as company material (COMAT);
 - 7) exemptions and approvals in the operations specifications to carry dangerous goods;
 - 8) requirements for the air operator certificate (AOC);
 - 9) duties of flight dispatchers or others in the operational chain of command with respect to emergency response to reflect the fact that not all operators use the services of flight dispatchers; and

- 10) the feasibility of including these requirements in Annex 6, Part II — *International General Aviation — Aeroplanes* and Annex 6 — *Operation of Aircraft*, Part III — *International Operations — Helicopters*, Section III.

6.3.5 The meeting was invited to determine working arrangements which would enable efficient coordination with the OPSP in developing operational provisions in Annex 6 and to agree to begin work with the OPSP and the Secretariat as soon as possible.

6.3.6 The panel strongly supported the work undertaken by the OPSP and showed great interest in working with the Dangerous Goods Sub-Group (DGSG) to incorporate dangerous goods requirements in Annex 6. The Secretary noted that this work would complement the proposed amendment to Annex 18 which clarified the oversight responsibilities of States (see paragraph 1.2).

6.3.7 It was agreed the most effective way of commencing the work would be through correspondence. A list of OPSP members would be provided to the DGP; those DGP members who had counterparts from their States on the OPSP were encouraged to coordinate with each other. The OPSP Secretary reported that his panel would hold a working group meeting in September 2012. He hoped to bring a mature document to that meeting. This he felt was very feasible, recognizing that the provisions already existed. A full OPSP meeting was scheduled for 2013; he anticipated a recommendation would be made to the ANC from that meeting. Assuming the proposal would go through the amendment cycle successfully, he hoped it would become applicable by 2015 at the latest.

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