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WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-SECOND MEETING

Montréal, 5 to 16 October 2009

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

REPORT OF THE MEETING OF THE WORKING GROUP OF THE WHOLE (DGP-WG08) The Hague, 3 to 7 November 2008

(Presented by the Secretary)

SUMMARY

This paper presents the report of the DGP Working Group of the Whole (WG/08) Meeting held in The Hague from 3 to 7 November 2008. It also includes a consolidation of proposed amendments arising from the WG/08 meeting in the appendix.

The DGP is invited to note the contents of this working paper.

1. INTRODUCTION

1.1 The meeting of the Dangerous Goods Panel Working Group of the Whole was opened by Mr. Mark Dierikx, Director-General for Civil Aviation and Maritime Affairs, Kingdom of the Netherlands on 3 November 2008. Mr. G. Leach was elected Chairperson of the meeting and Ms. Diantha Raadgers was elected Vice Chairperson. Mr. Leach, on behalf of the working group, thanked Mr. Mark Dierikx, for the excellent hospitality provided by the Kingdom of the Netherlands.

2. ATTENDANCE

2.1 The meeting was attended by the following panel members and advisers:

Members	Advisers/Observers	State/International Organization
A. Tusek	L. Willoughby	Australia
	F. Kirchnawy	Austria

Members	Advisers/Observers	State/International Organization
	R. Pacheco	Brazil
	J.F. Salles	
	T. Vieira	
G. Branscombe	D. Sylvestre	Canada
	T. Howard	
	M. Pelletier	
K. Vermeersch		Belgium
R. Jiang	J. Abouchaar	China
	Z. Qiu	
	W.Y. Chan	(Hong Kong)
J. Le Tonqueze		France
H. Brockhaus	P. Blümel	Germany
	G. Closhen	
	M. Marx	
	M. Philippi	
	C. Weber	
	D. Shaw	Ireland
	K. Ohta	Japan
	J. Nishimura	
	A. Cho	
	Y. Watanabe	
	P. Seok-Won	Republic of Korea
D. E. Raadgers	A. Appels	Netherlands
	P. Arts	
	W. Hoogerhout	
	P. Huurdeman	
	T. Muller	
	A. Oosterhof	
	E. Roelofsen-de By	
	A. Schilperoord	
	D.A. Sepanan-Lankarani	
	H van der Maat	
	M. B. van der Meide	

Members	Advisers/Observers	State/International Organization
	V. Melis P.G. Wildshut	
M. Evans		New Zealand
	B. Davidsen	Norway
	D. Mirko D. Kurdchenko	Russian Federation
	L. Calleja E. Santos M. Iniesta	Spain
	R. Joss-Trachesel	Switzerland
	H. Al Muahiri P. Balasubramanian P. King	United Arab Emirates
G. Leach	S. Pinnock R. McLachlan J. Hart	United Kingdom
R. Richard	C. Bonanti J. McLaughlin D. Pfund	United States of America
	E. Sigrist	CEFIC
	N. McCulloch	DGAC
	V. Krampe R. Wichert A. McCulloch	European Aerosol Federation Fuel Cell Council Global Express Association (GEA)
D. Brennan	P. Oppenheimer	IATA
M. Rogers	R. Gierlings W. Schuurman	IFALPA

Members	Advisers/Observers	State/International Organization
	G. Kerchner	Portable Rechargeable Battery Association (PRBA)
K. Rooney		Int. Civil Aviation Organization (ICAO)

3. REVIEW OF THE REPORT

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

3.1.1 Notification to ICAO of Appropriate Authority Responsible for Air Transport of Dangerous Goods (DGP-WG/08-WP/31)

3.1.1.1 The meeting was informed of the results of the ICAO Universal Safety Oversight Audit Programme in which fifty per cent of States failed to notify ICAO of the appropriate national authority. Members supported the Secretary's view that more detailed information regarding the appropriate national authority was necessary and would be beneficial for the transport of dangerous goods, especially in the issuance of approvals and exemptions. It was also noted having this information easily accessible would facilitate the investigation of incidents.

3.1.1.2 It was noted by a number of members that States should be required to nominate a person responsible for dangerous goods transport by air and that clear coordination should exist between this point of contact and other authorities who may be responsible for certain classes.

3.1.1.3 It was agreed a new proposal, taking into account the above comments, would be prepared for DGP-WG09.

3.2 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 2011/2012 Edition

Part 1 — General

3.2.1 Definition of a Fuel Cell and Definition of a Fuel Cell Cartridge (DGP-WG/08-WP/3)

3.2.1.1 A proposal to add definitions for fuel cells and fuel cell cartridges to the glossary was agreed on the basis it could alleviate possible confusion with pneumatic tools and compressed gas cartridges. The Secretary was requested to ask the UNSCTDG to include the definition for fuel cell in the Model Regulations.

3.2.2 **Exceptions for Dangerous Goods of the Operator (DGP-WG/08-WP/6)**

3.2.2.1 A proposal to permit operators to transport lithium battery powered devices, such as electronic flight bags, credit card readers, and spare batteries was supported. Although it was agreed that the provisions of Part 1;2.2 could be utilized (subject to approval from the State of the Operator), it was considered preferable to include a new provision in 1;2.2 similar to that which is already permitted for passengers along with an additional provision requiring that the conditions of carriage and use of such devices be included in the operations manual. This would allow for additional controls on the number and size of batteries together with the number of spare batteries relevant to the type and range of aircraft to be specified and approved by the State of the Operator. The proposal was agreed.

3.2.3 **Definition of "Cargo" (DGP-WG/08-WP/7)**

3.2.3.1 Following the introduction of a definition for "cargo" at DGP/20, the possibility had arisen for stores that are dangerous goods not to be included on the written information to the pilot-in-command. It was agreed this was an unintended consequence of the decision taken at DGP/20 which was primarily to clarify the training requirements of the Technical Instructions. An additional problem which had arisen related to the transport of "courier bags"; on the basis there was no definition for baggage, the processing of such baggage by operators by means of a baggage tag rather than by the issuance of an air waybill or consignment note was considered an acceptable practise.

3.2.3.2 A proposal to include a definition for "baggage" was agreed. However, a suggestion to include a new definition for "cargo" specifically for incorporation in the Instructions and differing from that in Annex 9 was not supported. An alternative approach to clarify in Part 7 that "stores" should be considered as cargo except when specifically provided for in Part 1;2.2 was supported. It was noted that undeclared dangerous goods in cargo and mail would also need to be taken into account.

3.2.3.3 A new proposal will be made at DGP-WG09.

3.2.4 **Training of Dangerous Goods Inspectors (DGP-WG/08-WP/12)**

3.2.4.1 The problem of lack of trained dangerous goods inspectors was raised during an analysis of the ICAO Universal Safety Oversight Audit programme findings. The principle of requiring training for dangerous goods inspectors was supported in general but it was suggested that rather than mandating Category 6 level training, guidance material should be developed for inclusion in the Supplement. It was noted that such guidance would be useful in developing consistent standards for dangerous goods inspectors, recognizing that additional areas of competence such as investigator skills would need to be added to the technical knowledge requirements.

3.2.4.2 The Secretary was asked to check on the legal aspects of making such training mandatory, taking into account the requirements in Annex 6 for operations inspectors to be trained. Based on the outcome of this research, a new proposal will be presented at DGP-WG09.

3.2.5 **Replacement Parts Transported in Containers Specifically Designed for their Transport (DGP-WG/08-WP/16)**

3.2.5.1 The meeting agreed that the intent of Part 1;2.2.2 was to allow transfer between operators of specifically designed containers for replacement dangerous goods articles or substances. It was recognized that this practise commonly occurred and that the packaging, whilst not bearing a UN

specification mark, provided the same level of safety for different operators. However, a number of members suggested that the legal position needed to be clarified, especially in relation to multi-modal journeys coincident to air transport. In addition, experience of incidents involving COMAT suggested some controls might be necessary. A paper to DGP-WG09 which would address these wider issues was expected.

3.2.6 **"Net Quantity" for Class 1 Articles (DGP-WG/08-WP/26)**

3.2.6.1 The difference between the Instructions and the UN Model Regulations (and all other modal regulations) for the net quantity of explosive material and the problems this created when preparing documents for multi-modal transport of Class 1 articles was discussed.

3.2.6.2 A proposal to add a definition for “net explosive mass”(NEM) was supported in general but a cautious approach was recommended on the basis of the impact this might have on the permitted net quantity limits per package. It was suggested this should be examined by explosive specialists, perhaps taking a risk based approach; this could also be reviewed by the working group on reformatting of packing instructions for Class 1.

3.2.6.3 The proposer asked for those interested in the issue to correspond with him so that a new paper could be presented at DGP-WG09.

3.2.7 **Training of Security Personnel (DGP-WG/08-WP/44)**

3.2.7.1 Information was provided on the programme undertaken in one State to train security personnel on dangerous goods. An e-learning tool for the transport of dangerous goods addressing all modes was described and a link to it provided (http://trainonline.ch/clariant). A number of members welcomed the paper, recognizing it addressed the potential problem of the lack of a coordinated training programme for security personnel, especially when security was contracted out to third parties. The Secretary was asked to prepare a paper addressing this issue for the next meeting of the Aviation Security Panel.

3.2.8 **Carriage of Dangerous Goods on Helicopters (DGP-WG/08-WP/57)**

3.2.8.1 The meeting agreed it would be desirable to develop provisions pertaining to helicopter operations involving dangerous goods. A number of members noted in particular such operations to off shore oil rigs in their States and supported further work of this issue. A new paper will be presented to DGP-WG09.

Part 2 — Classification

3.2.9 **Gauge or Absolute Pressure in Gas Description (DGP-WG/08-WP/8)**

3.2.9.1 The meeting agreed that clarification regarding receptacle pressure should be given in the Instructions and that the most appropriate mechanism would be to incorporate paragraph 1.2.2.5 of the UN Model Regulations in Part 2, Chapter 2.

3.2.10 **Ignition Exciters Containing Radioactive Spark Gaps in Large Aircraft Engines (DGP-WG/08-WP/15)**

3.2.10.1 Clarification was sought regarding the correct classification of ignition exciters containing radioactive spark gaps when contained in large aircraft. Some members requested additional information regarding the activity of the radioactive material, noting that the item might even be considered exempt, rather than excepted. A new proposal based on comments received will be presented at DGP-WG09. The group felt that classification as UN 2911 **Radioactive material, excepted package — instruments** or **articles** may be appropriate, but this was dependent on the activity of the article, which was not known. It was suggested that further information would need to be acquired for a definitive view.

3.2.11 **Classification of Environmentally Hazardous Substances for Air Transport (DGP-WG/08-WP/27)**

3.2.11.1 The meeting reviewed a proposal to align the classification criteria for environmentally hazardous substances to that in the UN Model Regulations which, in contrast to the present classification, was only dependent on classification by the States of origin, transit or destination.

3.2.11.2 A number of members did not support the extension, arguing that the classification criteria were relatively new having been adopted from GHS and that it would place a large burden on industry. It was also argued that the addition of the resultant additional dangerous goods on the NOTOC could cause problems for emergency responders – environmentally hazardous substances would not pose the same risk as, for example, aviation fuel or other dangerous goods.

3.2.11.3 However, counter arguments were put forward by a majority of members who noted that GHS criteria applied to all sectors, not just transport, and that industry would need to make classification assessments and include the information on material safety data sheets. It was also considered appropriate that ICAO should align with the UN as had been done by the other modes.

3.2.11.4 On reviewing the proposed amendments, it was suggested the revision to Special Provision A97 should simply change the optional requirement to being mandatory. It was also suggested that the change to 2;9.2.1 should be placed in square brackets which would allow industry an opportunity to review the decision and to provide comments. This was agreed.

3.2.11.5 It was noted that the panel would need to revisit the issue at DGP-WG09 to discuss whether it was appropriate to require these dangerous goods to be included on the NOTOC and/or subject to an acceptance check in addition to reviewing industry comments.

3.2.12 **Classification of Mixtures — Supplement to DGP-WG/08-WP/32 (DGP-WG/08-WP/63)**

3.2.12.1 The meeting reviewed the discussion documents on the classification of mixtures prepared by the Rapporteur of the Correspondence Working Group which had been established by the UN at the request of ICAO. The addition of definitions for “mixture” and “substance” as defined in the GHS was believed to be helpful. It was noted that the hierarchy of proper shipping name selection was crucial since classification formed the basis of the entire transport chain. It was therefore very important for industry to play an active role in what should be a wide sectorial discussion.

3.2.12.2 The Secretary was instructed to recommend the paper at the upcoming UN meeting and to support further work in the next biennium, especially in relation to clarification of the language used.

3.2.13 **Classification of 1.4S Explosives (DGP-WG/08-WP/41)**

3.2.13.1 The meeting was informed of discussions related to classification of 1.4S explosives which had taken place at the UN July 2008 meeting and of proposed amendments to be discussed at the December meeting to clarify the 1.4S test criteria. In particular, a clear interpretation of what was meant by hazardous effects to be "confined within the package" was needed on the basis these explosives are permitted for transport on passenger aircraft. It was believed that the proposed changes would impact particularly on shaped charges but that an indicative list of affected items was being developed

3.2.13.2 The meeting agreed the ANC and Council should be requested to issue an addendum containing an amendment to clarify the 1.4S classification, if agreed by the UN, on the basis of that proposed in ST/SG.AC.10/C.3/2008/89. It was also agreed this information should be disseminated by means of a safety advisory notice in order to make regulators and industry aware of the amendment. This would not single out shaped charges specifically but would allow manufacturers to design packaging which would permit the explosives to continue to be classified as 1.4S. It was agreed the UN should be informed of the panel's intention to issue such an addendum.

3.2.13.3 In the event the UN does not ratify the proposed text, it was agreed a working group by correspondence should discuss the issue further.

3.2.14 **Classification of Self-Reactive Substances and Organic Peroxides (DGP-WG/08-WP/60)**

3.2.14.1 Differing interpretations of the requirements for self reactive substances and organic peroxides of type G were discussed; particularly the need for an approval to accompany the transport document even when the substance is not subject to the transport regulations. It was agreed in principle that the relevant paragraphs in the UN Model Regulations should be added. However, it was noted the language used could be improved to clearly indicate self reactive substances and organic peroxides of type A were forbidden for air transport. It was also noted that the terminology should be consistent with that of classification. It was agreed that an information paper would be submitted by the proposer to the UN, seeking clarification and a new paper would be prepared for DGP-WG09.

3.2.15 **Classification of viscous substances (DGP-WG/08-WP/61)**

3.2.15.1 The meeting confirmed an earlier decision not to include paragraph 2.3.2.5 of the UN Model Regulations on the basis that should such an exclusion be included, up to 220 litres of viscous substances with a flashpoint greater than 23 C would be non-regulated. It was noted that viscous substances were typically transported in packagings of lesser integrity and should a fire occur on board an aircraft, they would contribute to the fire, even if there was no leakage.

3.2.15.2 It was agreed that this and similar decisions should be incorporated in the guidance document for the benefit of future panel members and advisers. It was also noted that the guidance document needed updating; two members undertook to do this.

Part 3 — Dangerous Goods List, Special Provisions and Limited and Excepted Quantities

3.2.16 **Assignment of Packing Group to UN 3316 (DGP-WG/08-WP/5)**

3.2.16.1 The requirement for the assigned packing group for UN 3316, even when in limited quantities, to be included on the transport document was discussed. A proposal to align Special Provision A44 with its UN equivalent, SP 251 and to make a consequential deletion in packing instruction 915 was agreed.

3.2.17 **Special Provision A144 For Protective Breathing Equipment (Pbe) (DGP-WG/08-WP/17)**

3.2.17.1 A proposal to clarify that the requirements of Special Provision A1 did not apply to aircrew protective breathing equipment when consigned under Special Provision A144 was agreed, subject to a minor editorial amendment. One member noted that in his state, approval would still be required on the basis this equipment contained chemical oxygen generators; this would be notified in a state variation.

3.2.18 **Proper Shipping Name For Un 1950 Aerosols for Types that have Narcotic, Noxious or other Properties (DGP-WG/08-WP/23)**

3.2.18.1 The issue of whether proper shipping names for aerosols containing narcotic, noxious or "incapacitant" substances should be created was discussed. It was noted that although an entry existed for tear gas devices, consideration could be given to the broader issue of aerosols used for defensive purposes e.g. those containing capsicum with either a flammable or non-flammable propellant. It was suggested a new proposal would be presented at DGP-WG09 which would focus on the incapacitant nature of the aerosol contents.

3.2.19 **Shipping Prototype and Low Production Lithium Batteries (DGP-WG/08-WP/25)**

3.2.19.1 The need to transport prototype and low production lithium batteries was raised, following an editorial correction to reinstate 'aboard cargo aircraft' in Special Provision A88. It was noted these batteries are not subjected to UN testing requirements either because they are still in the early design phase (prototype) or because they are part of a very limited production run (low production).

3.2.19.2 Although the UN Model Regulations and the IMDG Code permit shipments of these batteries under certain conditions, only prototype batteries are permitted for transport in the Instructions provided a State of Origin approval is obtained. It was noted that by definition, only a small number of such shipments could be expected, which in itself should lead to fewer incidents. A proposal to align the requirements with the other regulations was agreed in principle, subject to consideration of additional conditions being specified for inclusion in the approval.

3.2.19.3 An additional proposal to permit the transport of such batteries when contained in equipment or vehicles was also discussed. It was noted provisions for hybrid vehicles would also need to be considered.

3.2.19.4 It was agreed new proposals, based on the discussion, would be presented at DGP-WG09.

3.2.20 **Special Provision A152 (DGP-WG/08-WP/28)**

3.2.20.1 The issue of the non-restricted nature of dry shippers when used for transport was discussed. It was noted that although these are generally intended for the transport of non-dangerous goods, the wording of Special Provision A152 seems to preclude their use for transporting dangerous goods such as infectious substances in Category B. A proposal, modified to clarify the non-restricted clause applied only when transporting non-dangerous goods, was agreed.

3.2.21 **Limited Quantities (DGP-WG/08-WP/30)**

3.2.21.1 The meeting noted the information provided during the discussion of DGP-WG/08-WP/50.

3.2.22 **State of Origin Approval (DGP-WG/08-WP/40)**

3.2.22.1 Limitations related to the involvement of the State of the Operator were outlined in a discussion on approvals sought under Special Provisions A1, A2 or A109. Under these special provisions, only approval from the State of Origin is required. It was suggested that this was inappropriate for the State of the Operator in so far as it was a potential conflict with the oversight responsibilities contained in Annex 6; approvals may be given by a State of Origin where it had been demonstrated under the ICAO Universal Safety Oversight Programme no dangerous goods experts were present; and some State variations required notification if an operator registered in their State was granted an approval form another State under these special provisions.

3.2.22.2 Discussion focussed on the need for clear guidance on the issuance of approvals and exemptions and under what circumstances they should be granted. One member suggested that for approvals granted under A2, consideration should be given to limiting transport to cargo aircraft only. Another suggested that approval from the State of Manufacture might provide an alternative approach to ensuring access to all relevant information necessary for the granting of such approvals or exemptions. It was noted that obtaining exemptions from all States concerned could be a very lengthy time process and that the relevance of seeking approval from the State of Overflight should be reconsidered.

3.2.22.3 The meeting supported further discussion of this issue and suggested one day should be devoted to this topic at the next working group meeting; this was agreed.

3.2.23 **Limited Quantities and Consumer Commodities (DGP-WG/08-WP/50)**

3.2.23.1 The meeting was reminded of the considerable effort which had been devoted to the harmonization of the limited quantities provisions and of the decisions taken by the UN at its July 2008 meeting. It was recognized that the term “limited quantities” as used in air transport was significantly different with respect to full hazard communication and smaller inner quantity limitations. The UN had requested ICAO to review the proposed amendments with a view to facilitating multimodal transport whilst maintaining an appropriate level of safety.

3.2.23.2 Following lengthy discussions, the meeting agreed to the following:

a) to consider within this biennium an alternative term for air mode limited quantities. This would help minimize confusion as the concept in terms of both conditions and requirements were different for the UN Model regulations and for the Instructions;

b) to retain the current hazard communication requirements. This would ensure the appropriate measures are kept for air transport, especially with regard to transporting limited quantity packages on passenger aircraft and to segregation requirements;

c) to replace the current "limited quantity" or "LTD QTY" marking with the new UN limited quantity marking with the letter "Y" placed inside. This would indicate to surface mode personnel that the package, although bearing a hazard label as required for air transport, complied with the provisions of both the UN Model regulations (and other surface modal requirements) as well as the Instructions;

d) to recommend that, should the package dimension be such that only smaller marks are possible, a minimum size of 50 mm x 50 mm be used. This would ensure that packages prepared for a surface mode would be easily identified.

3.2.23.3 The meeting agreed that an information paper be sent to the UN, informing that body of the decisions taken. It was noted the UN would be informed should the DGP agree to change the term "limited quantity" during further discussion of this issue.

3.2.24 **Environmentally Hazardous Substances (DGP-WG/08-WP/59)**

3.2.24.1 Following the decision taken at DGP/21 to clarify that environmentally hazardous substances were those which met the classification criteria in the UN Model regulations, the meeting agreed to consequential amendments to Special Provision A158 and to 5;2.4.9 and as modified editorially by the discussion. It was further agreed these amendments should be issued in a corrigendum to the 2009/2010 edition of the Instructions.

3.2.25 **Limited Quantities (DGP-WG/08-WP/64)**

3.2.25.1 The meeting noted the information provided during the discussion of DGP-WG/08-WP/50.

Part 4 — Packing Instructions

3.2.26 **Packing Instructions for Chlorosilanes (DGP-WG/08-WP/2)**

3.2.26.1 A proposal to align the Instructions with the UN Model regulations regarding quantity limits and packing provisions, thus removing less restrictive provisions in the former, was agreed, subject to correcting the UN number for Methyltrichlorosilane to UN 1250.

3.2.27 **Packing Instruction 900 (DGP-WG/08-WP/10)**

3.2.27.1 Following discussion of an incident in which leakage of gasoline from equipment containing an internal combustion engine occurred, the meeting noted the quarter tank capacity referred to in the packing instruction was that of the fuel tank of a vehicle, rather than that in equipment. It was agreed no amendment to the Instructions was required.

3.2.28 **Packing Instruction 602 – Internal Pressure and Temperature Tests (DGP-WG/08-WP/24)**

3.2.28.1 Difficulties experienced by packaging manufacturers in interpreting the requirements pertaining to the pressure differential test specified in packing instruction 602 was raised. A proposal to require separate tests for pressure and temperature requirements was made.

3.2.28.2 It was recognized that at present, different interpretations have resulted in packagings which may pass the test in one State and fail in another. It was agreed that clarification should be obtained from the UN so that a consistent approach for testing of the packaging components could be adopted by all modes. A working group by correspondence will develop new proposals for DGP-WG09 to consider for onward transmission to the UN.

3.2.29 **Packing Instruction 916 (DGP-WG/08-WP/46)**

3.2.29.1 The meeting agreed that the amendment to packing instruction 916 made at DGP/21 implied machinery or apparatus could not contain combinations of gases of division 2.2 and other dangerous goods specified therein and that this was not the intent. Following an editorial amendment to permit such combinations, the proposal was agreed.

3.2.30 **Marking / Labelling Requirements for Dry Ice in ULD (DGP-WG/08-WP/54)**

3.2.30.1 A proposal to clarify that shipper prepared ULDs containing dry ice as a refrigerant for other than dangerous goods did not require marking and labelling, was agreed subject to a minor editorial amendment.

3.2.31 **Ethyl chloride and similar gases (DGP-WG/08-WP/62)**

3.2.31.1 The meeting was informed that during the discussion by Council of the request by the DGP to issue an addendum related to mixtures containing ethyl chloride and similar gases, the panel was commended for the fast action that had been taken following the incident. In addition, the Council asked the panel to continue to monitor the issue. On the basis there was no knowledge of approvals being sought, it was now proposed to prohibit the transport of such mixtures in aluminium alloy cylinders

3.2.31.2 Some members believed this could have a drastic impact on industry as it would prohibit all cylinders, including those with a suitable coating to ensure compatibility. It was suggested as a compromise that, in addition to approval from the State of Origin, approval from the State of the Operator should be added. Others suggested any amendment should be placed in square brackets which would allow industry opportunity to comment before a final decision was taken.

3.2.31.3 The meeting was informed of a draft ISO standard which stated that aluminium alloy cylinders were not acceptable for concentrations of ethyl chloride greater than 0.1%.

Secretarial note: ISO 11114-1 “Transportable gas cylinders – compatibility of cylinder and valve materials with gas contents – Part 1: Metallic materials”

3.2.31.4 The proposal, as modified to make reference to State of Operator, was then agreed. It was also agreed the ANC and Council should be requested to issue an addendum.

3.2.31.5 Noting that no members had received requests for approvals using this provision, it was agreed further information should be sought from States by means of a State letter. This would permit the panel to monitor the situation and to decide if other amendments were warranted. It was also agreed States should be informed of the draft ISO standard which would assist them when issuing approvals. The Secretary was also requested to develop a safety alert for the website; this would have the additional benefit of disseminating the information as widely as possible.

Part 5 — Shipper's Responsibilities

3.2.32 **Subsidiary Risk Labels (DGP-WG/08-WP/4)**

3.2.32.1 A proposal to request the UN to employ consistent terminology when discussing hazard labels was supported in principle. However, a proposal to delete 5;3.1.2 was not agreed at this time. It was agreed this issue could be revisited later.

3.2.33 **Information regarding the use of special provision(s) on a shipping document (DGP-WG/08-WP/19)**

3.2.33.1 The paper was withdrawn.

3.2.34 **Dangerous Goods Transport Data (DGP-WG/08-WP/22)**

3.2.34.1 The working group was informed of the proposed standard in Annex 9 – Facilitation related to the transfer of information for radioactive material and the desirability of the prompt release of such material. It was suggested that requesting the telephone number of the consignee would facilitate the transport process.

3.2.34.2 Some members noted a similar requirement in their national regulations and observed it had been beneficial in their States. Others suggested a mandatory requirement could lead to an increase in denial of radioactive material shipments, the opposite result of what the proposed new Annex 9 Standard had been designed to achieve. It was suggested that the proposal should be limited only to Type B(U) or Type B(M) packages; this would permit the present rapid transport Type A and industrial packages.

3.2.34.3 Following an amendment to make the requirement optional, the proposal was agreed.

3.2.35 **Environmentally Hazardous Substances (DGP-WG/08-WP/34)**

3.2.35.1 A proposal to add provisions permitting markings required by other modes of transport was discussed. It was suggested that if a shipper decided to consign goods as UN 3077 or UN 3082 for road transport in Europe, it would be marked accordingly. However, if these goods were then transported by air internationally and were not declared as UN 3077 or UN 3082, it was suggested that operators might not accept them because they had not been declared as environmentally hazardous. It was suggested that the proposals, if approved, should be issued in an addendum to the Instructions.

3.2.35.2 A number of members agreed with the intent behind the proposal to permit markings required by other modes but had difficulty with the language used. Others suggested the permissive nature of the requirement for environmentally hazardous substance marking negated the need for such an amendment because if the shipper decided to declare the goods as being environmentally hazardous, then the marking was required. It was explained that frequently, for air transport, an overpack was used by industry so that the shipment was presented as regular cargo.

3.2.35.3 With regard to the request for an addendum to be issued, the Secretary reminded the meeting that this topic could not be considered as being one of an urgent, safety nature and therefore, could not agree to such a request. However, she suggested clarification could be provided and disseminated on the public website.

3.2.35.4 A guidance document was developed which explained the difference between the other modal (or national) requirements with those of the Instructions and took into account the decision which had been agreed for DGP-WG/08-WP/27. DGP members were asked to provide feedback as soon as possible so that the material could be published on the ICAO website.

3.2.36 Overpacks Containing "Cargo Aircraft Only" Dangerous Goods (DGP-WG/08-WP/36)

3.2.36.1 The working group was reminded of the changes made to the provisions concerning label visibility and accessibility of packages and overpacks containing cargo aircraft only dangerous goods. It was suggested that as a consequence, 5;4.1.1 e) could now be deleted. It was confirmed that the new requirement only required accessibility to the overpack, not necessarily to the individual packages contained within; previously only one package per overpack was permitted.

3.2.36.2 It was agreed further discussion of the consequences arising from the amended provisions would be helpful; new proposals would be brought to DGP-WG09.

3.2.37 Documentation Requirements for Quantity (DGP-WG/08-WP/43)

3.2.37.1 A proposal to amend the quantity requirements in the dangerous goods transport document pertaining to those items which neither had a net/gross mass nor "no limit" entry in able 3-1 was agreed subject to an editorial correction. A member suggested that further consideration would be necessary for certain lithium battery entries; a new proposal would be made at DGP-WG/09.

3.2.38 Self-Reactive Substances and Organic Peroxides "Keep Away from Heat" Requirements (DGP-WG/08-WP/51)

3.2.38.1 The working group agreed that the requirement for a statement on the dangerous goods transport document related to the need to protect packages containing substances assigned Special Provision A20 should be reviewed. It was noted no similar requirement existed in the UN Model Regulations or surface modal regulations even though packages transported by surface mode might be subjected to more extremes of heat than in air transport. It was further noted that the most sensitive self-reactive substances and organic peroxides were forbidden and could only be transported under State exemption; those which were permitted were less sensitive and therefore, did not need this additional requirement.

3.2.38.2 A proposal to align the Instructions with the UN Modal Regulations will be made at DGP-WG/09.

3.2.39 Orientation Arrows on Cryogenic Receptacles (DGP-WG/08-WP/52)

3.2.39.1 A proposal to align the Instructions with the UN Model regulations with regard to the number of orientation arrows required on packaging containing refrigerated liquefied gases was agreed.

3.2.40 **Description of "Overpacks" on the Dangerous Goods Transport Document (DGP-WG/08-WP/53)**

3.2.40.1 The issue of how best to describe packages contained in overpacks on the dangerous goods transport document was raised. Some members believed that the present requirements in the Instructions were sufficiently clear and that the addition of examples might not provide any additional safety benefit. It was suggested that any amendment to the requirement should not be of a prescriptive nature, recognizing the potential cost to shippers who would have to amend their computer programmes. The proposer agreed to further consultation with industry before providing a revised paper to DGP-WG09.

Part 6 — Packaging Nomenclature, Marking, Requirements and Tests

3.2.41 **Non-Un Specification Gas Cylinder Specifications (DGP-WG/08-WP/38)**

3.2.41.1 An apparent inconsistency regarding non-UN specification cylinders was raised, specifically the difference between States of transport and use versus States involved with approval and filling. A number of members agreed further consideration of this issue was necessary and suggested the State of manufacture should also be taken into account. It was agreed a new paper would be prepared for DGP-WG09.

Part 7 — Operator's Responsibilities

3.2.42 **Information to Passengers on those Dangerous Goods which may be Carried (DGP-WG/08-WP/13)**

3.2.42.1 The issue of how best to inform passengers of the dangerous goods they were permitted to carry was raised in a proposal to require operators to provide passengers with such information in advance of check-in. Some members welcomed the proposal and suggested that by enhancing passenger awareness, safety would be increased whilst others suggested it might also facilitate security. One member believed that a concerted effort involving operators and airports in educating passengers, preferably before arrival at the airport, would be desirable. Others were reluctant to mandate what a passenger was allowed to carry, suggesting it would be difficult to enforce and were therefore in favour of making the requirement optional.

3.2.42.2 The proposal, modified to make the requirement optional, was agreed.

3.2.43 **Storage of Dangerous Goods Consignments while in Transit (DGP-WG/08-WP/14)**

3.2.43.1 The paper was withdrawn.

3.2.44 **Separation of Radioactive Material from Live Animals (DGP-WG/08-WP/18)**

3.2.44.1 Clarification based on IAEA guidance material was provided on the reasons why segregation distances between radioactive material and humans is greater than that for animals – the distances were based on maximum annual travel periods for crew and frequent travellers which would result in greater exposure to humans rather than to animals and hence led to more restrictive values. A

second factor taken into consideration was the average life span – the cumulative dose to which animals would be exposed would be much less that that for humans on the basis of their much shorter life span. The majority believed these were good reasons to retain the current requirements.

3.2.45 **Flameless Ration Heater (FRH) and Self-Heating Beverage (DGP-WG/08-WP/20)**

3.2.45.1 The meeting was requested to consider the addition of an entry for flameless ration heaters and self heating beverages in the lists of hidden dangerous goods because they sometimes contained regulated dangerous goods such as UN 2813 and UN 1910.

3.2.45.2 A number of members supported the proposal in general. Others said they would support their prohibition in carry on baggage because of incidents which had occurred but would allow their transport in checked baggage subject to size and quantity limits. It was suggested that examples of the chemicals involved e.g. calcium oxide should be included in the general description rather than a reference to flameless ration heaters.

3.2.45.3 The proposer offered to take the comments into account and prepare a new paper for DGP-WG09.

3.2.46 **Transport Of Dangerous Goods in Non-Pressurized Cargo Holds (DGP-WG/08-WP/21)**

3.2.46.1 The meeting discussed a proposal to add a specific pressure differential value to the note under 7;2.4.1 related to the transport of dangerous goods in non-pressurized holds. A number of members asked for further explanation of the value, on the basis it was unclear whether the values referred to a reduction “of” or “to” an absolute pressure. It was suggested clarification was also required on the differences between normal and extreme conditions of transport.

3.2.46.2 It was agreed that members interested in the issue would assist in developing a new proposal for DGP-WG09.

3.2.47 **Signing of Information to Pilot-In-Command (DGP-WG/08-WP/48)**

3.2.47.1 Clarification was sought as to when the NOTOC should be signed and by whom. It was explained that different operators had different interpretations of the requirement and it was suggested a standardized approach should be adopted. However, it was explained operators needed a flexible system to allow for different procedures and protocols to be followed, depending on the particular requirements of the individual aircraft operation. It was suggested that consideration might be given to amending the requirement so that it began “An operator must have a process to ensure that….”; however, this was not pursued.

3.2.48 **Securing of Dangerous Goods (DGP-WG/08-WP/66)**

3.2.48.1 The meeting agreed that the existing provisions pertaining to the securing of dangerous goods were sufficient and applied equally to goods in a unit load device which were on an aircraft as to those loaded directly onto the aircraft.

3.2.49 **Securing of dangerous goods (DGP-WG/08-WP/67)**

3.2.49.1 The meeting agreed there was a need to develop provisions pertaining to the securing of packages within overpacks. Comments were invited from panel members and a new proposal will be presented at DGP-WG09.

Part 8 — Provisions Concerning Passengers and Crew

3.2.50 **Carriage of Energy Efficient Light Bulbs Containing Mercury by Passengers (DGP-WG/08-WP/11)**

3.2.50.1 A proposal to permit passengers to carry energy efficient light bulbs containing mercury was discussed. It was explained that bulbs, containing up to 100 mg of mercury, were not subject to the Instructions and were thus permitted as cargo whilst similar bulbs intended for home use and containing on average only 4 mg of mercury were forbidden. A number of members noted that if an amendment to delete "when carried as cargo" was made to Special Provision A69, it might still be considered as forbidden under Part 8. A proposal to amend 8;1.1.1 was agreed; it was noted that the provision would be self-limiting essentially due to the limited number passengers would carry.

3.2.51 **Electroshock Weapons (Taser) Carried by Passengers (DGP-WG/08-WP/29)**

3.2.51.1 The increasing use of electroshock weapons by law enforcement personnel with a consequential increase in requests seeking permission for their transport was discussed. It was noted that incidents involving fires have occurred with these portable electronic devices and that any consideration to permitting their transport would require some condition, such as removal of the compressed gas cylinder used to propel the probes delivering the electrical charge, to prevent inadvertent operation.

3.2.51.2 Some members believed that there was no need to include provisions in Part 8 for their carriage; others felt law enforcement personnel should be permitted to transport them in their checked baggage subject to approval by the operator. The proposer said a new proposal, forbidding their transport in passenger baggage but allowing law enforcement personnel to carry them, would be presented at DGP-WG09.

3.2.52 **Cash Boxes Transported by Aircraft (DGP-WG/08-WP/35)**

3.2.52.1 The total prohibition on security-type equipment, such as cash boxes, containing dangerous goods was raised. It was explained that an increasing number of criminal attacks had occurred at airports and it was believed if the prohibition could be modified to allow certain cash boxes, the number would decrease. It was noted that previously, cash boxes utilized a pyrotechnic charge and/or a lithium battery to render the cash worthless (e.g. by contamination with ink). However, new generation cash boxes did not contain pyrotechnic devices, rather they relied on small cylinders of gas with some also containing a lithium battery.

3.2.52.2 A number of members suggested that if the component dangerous goods were shown to be exempted from the Instructions, they would support a proposal clarifying the prohibition referred only to those cash boxes whose components were fully regulated. It was noted that there should be no inadvertent operation outside of the box and that clear criteria would need to be developed. It was further noted that any modification to the prohibition should restrict the transport to checked baggage only.

3.2.52.3 It was agreed a working group by correspondence would discuss the issue further and prepare a new proposal for DGP-WG09.

3.2.53 **Flares at Football (Soccer) Matches (DGP-WG/08-WP/37)**

3.2.53.1 The possibility that football fans carry flares in their baggage when travelling by air to matches was raised. It was agreed that educating fans of the prohibition of flares in baggage was desirable so that they would know before travel. A proposal that ICAO contact the Federation Internationale de Football Association (FIFA) was supported.

3.2.54 **Passenger Provisions for Consumer or Portable Electronic Devices (DGP-WG/08-WP/45)**

3.2.54.1 The meeting agreed that references to electronic devices in Part 8 should be consistent and that the preferred reference should be to "portable" electronic devices.

3.2.55 **Consignments of "Personal Effects" (DGP-WG/08-WP/47)**

3.2.55.1 The problem of passengers consigning baggage as cargo and describing it as "personal effects" was explained. If the baggage contained dangerous goods and was consigned as checked baggage, these dangerous goods would be permitted as stated in Part 8. However, if consigned as cargo, no such allowance is made.

3.2.55.2 It was agreed that it would be helpful to extend the passenger provisions to provide similar relief from the provisions and thus remove potential confusion. However, it was pointed out that caution was warranted in so far as a differentiation should be made between excess unaccompanied baggage and baggage being sent in advance e.g. by a passenger going on vacation versus dangerous goods being sent in such baggage as a means of avoiding having to declare it as cargo. It was suggested the issue should be brought to the attention of the Aviation Security Panel.

3.2.55.3 The meeting was informed of the common practise in some airlines to request passengers to complete a declaration that no dangerous goods were contained in the baggage but that inspections and/or incidents had revealed items were frequently found. From a safety consideration, it was noted that on narrow bodied aircraft, such "personal effects" baggage could end up with general freight in cargo compartments with no fire suppression. It was agreed a new paper would be prepared for DGP-WG09 which would take into account the above discussion.

3.2.56 **Battery Powered Mobility Aids (DGP-WG/08-WP/49)**

3.2.56.1 An incident involving a wheelchair battery fire was presented; it was explained that other, similar incidents had previously occurred. Two issues were specifically addressed – the need to have equivalent text in Part 8 to that contained in Special Provision A67 and the need to provide guidance on how to prepare and handle such mobility aids before loading. In addition, other aspects were discussed such as the definition of a mobility aid and the distinction in the requirement to disconnect for spillable versus non-spillable batteries.

3.2.56.2 Members agreed that with the increasing number of incidents, there was a need for outreach material to be developed to help educate passengers and suggested mobility aid manufacturers might assist in such an effort. Some members queried whether mobility aids should be restricted to people with physical disabilities, noting that some would consider battery operated golf trolleys as being included.

3.2.56.3 It was agreed that some initiatives, such as an indication on the wheelchair for a safe mode, should be considered as a longer term solution. It was noted that the provisions in Part 8 had been developed when most batteries were of the spillable type but that consideration should now be given to new practicalities such as vastly increased battery size and new types of battery e.g. lithium-ion. In the interim, the proposal to amend 8;1.1.2 e) was agreed, subject to placing the amendments in square brackets. A new proposal will be presented at DGP-WG09.

3.2.57 **Battery-Powered Devices (DGP-WG/08-WP/55)**

3.2.57.1 A proposal to permit the carriage and use of battery-powered medical devices by passengers was discussed. It was suggested that in a number of States, airlines were legally obliged to ensure they were not discriminating against passengers who wished to carry and use health care items such as portable oxygen concentrators. The meeting was therefore asked to consider whether it would be appropriate to permit such devices and under what conditions.

3.2.57.2 A number of issues were raised – the need for the flight crew to be notified in case of a medical emergency; the potential need to connect to the aircraft electrical supply; the possibility of electromagnetic interference with aircraft systems. and aircraft certification issues. It was noted that with new technology, the medical needs of society had to balanced against safety requirements for transport and that this issue would need to be addressed.

3.2.57.3 There was agreement in principle for the need to be addressed, noting that a special working group might be required to discuss the wide range of identified issues. A new proposal will be presented at DGP-WG09.

3.2.58 **Aerosols in Division 2.1 with no Subsidiary Risk for Sporting or Home Use (DGP-WG/08-WP/58)**

3.2.58.1 No support was expressed for a proposal to extend the provisions permitting passengers or crew to carry flammable aerosols for sporting or home use. It was explained that a requirement to prevent the inadvertent operation of aerosols had been added at DGP/21 to lessen incidents involving fires. It was noted that classification of aerosols was an area which should be examined further - the aerosol was classified on the contents to be expelled, rather than on the propellant which could itself be flammable. It was also noted that the majority of such aerosols could be obtained at the destination, thus removing any necessity to allow passengers to transport such aerosols. It was suggested educating passengers about alternatives would be preferable.

3.3 **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 9284) for incorporation in the 2011/2012 Edition**

3.3.1 **Loading on Passenger Aircraft Without Class B or C Cargo Compartments(DGP-WG/08-WP/39)**

3.3.1.1 The problem of appropriate packagings for articles permitted for transport under Part S-7;2.2 was raised. Although the objective was supported, it was suggested other text, such as “which must be in appropriate outer packaging”, could be developed which would remove the problem. It was agreed a new proposal would be presented at DGP-WG09.

3.4 Agenda Item 4: Amendments to the *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481)

3.4.1 Drill Code for Lithium Batteries (DGP-WG/08-WP/42)

3.4.1.1 The paper was withdrawn on the basis drill codes had been assigned for lithium batteries in the 2009/2010 edition of the Emergency Response Guide. A new paper concerning drill codes for all lithium battery entries will be presented at DGP-WG09.

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

Agenda Item 5.1: Review of provisions for dangerous goods relating to lithium batteries

3.5.1 Dimension of Handling Label for Lithium Batteries (DGP-WG/08-WP/9)

3.5.1.1 The meeting was reminded of the decisions made at DGP/21 to require a new lithium battery handling label for small, excepted cells and batteries as well as a reduction in the gross mass of permitted packages. As a consequence, problems had arisen with the specified label size being too large for some small packagings. It was proposed to have a new minimum label size similar to that allowed for infectious substances and to request this amendment be incorporated in an addendum to the Instructions.

3.5.1.2 It was explained because this was not a safety issue but rather one of assisting industry, a request for an addendum could not be sought. It was further explained that the time required to process such a request could not be done before 1 January 2009, as had been proposed.

3.5.1.3 Some members pointed out that the alleviation for the infectious substance label size had been made specifically to facilitate medical needs; no similar argument could be made for lithium batteries. Others noted that it was important for these labels to be clearly visible to ensure correct handling of these excepted cells and batteries and were sympathetic to consideration of specifying a label area rather than a label size.

3.5.1.4 A new proposal will be submitted to DGP-WG09.

Agenda Item 5.2: Reformatting of the packing instructions

3.5.2 It had been agreed following DGP/21 that packing instructions for Class 1 should be reformatted in the same style as those adopted for the 2011/2012 Edition of the TIs. Draft reformatted packing instructions were presented to WG08 for Class 1 based on text from the 15th edition of the UN Model Regulations. Text from the Technical Instructions was not used because there was some concern the TIs had not kept completely up to date with changes to the UN provisions. Areas which still needed to be considered by the Packing Instruction Working Group (PIWG) and the UN were highlighted. The working group was asked to provide the PIWG with comments by 27 February 2009 so that a proposal could be prepared for DGP-WG/09.

Agenda Item 5.3: Review of amendment process for the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284)

3.5.3 **"Fast Track" Notification Mechanism and Amendment Process (DGP-WG/08-WP/33)**

3.5.3.1 The meeting was informed of the Council request to examine the desirability of issuing an interim amendment to the Instructions as well as possible mechanisms to enable rapid dissemination of information when urgent, safety based issues are raised. This request was welcomed by members who noted that delays to safety should be minimized to the greatest extent possible. In addition, any mechanism which helped widen the distribution network for urgent information would help improve safety.

3.5.3.2 Members were invited to comment so that a paper could be submitted to the next session of the Air Navigation Commission.

3.5.4 **Promulgation of changes to the Technical Instructions (DGP-WG/08-WP/65)**

3.5.4.1 The process of amending the Technical Instructions which has been in operation since their initial development was explained. It was queried whether the process should be revised with a view to inviting comments from States on the proposed amendments recommended by the panel to the Air Navigation Commission.

3.5.4.2 A number of members advised any change in the process should be treated cautiously, noting that the present system worked well within the time constraints caused by the approval process involving Commission and Council. Others noted that all States could send observers to panel meetings and thus be more actively involved. In an effort to improve transparency of the process, the Secretary offered to notify States of the public website which contained all working papers and reports of meetings. This was agreed as being the optimum approach which would allow all States to be involved.

Agenda Item 5.4: Training

3.5.5 No papers were presented under this agenda item.

3.6 **Agenda Item 6: Miscellaneous dangerous goods issues**

3.6.1 **Freely Downloadable Technical Instructions For The Safe Transport Of Dangerous Goods By Air (Doc 9284) from the Internet (DGP-WG/08-WP/1)**

3.6.1.1 A proposal to make the Technical Instructions available from a public website free of charge was strongly supported on the basis that this could only enhance safety and facilitate a wider dissemination of the requirements contained in the Instructions. It was noted that for infrequent shippers and for those States with developing economies, the cost was considered prohibitive which frequently resulted in out-of-date regulations being used. The meeting was informed that after copies of the UN Model Regulations and the European road requirements (ADR) were placed on its website, increased sales resulted.

3.6.1.2 The meeting noted with interest the suggestion by the International Maritime Organization Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC) to place a copy of the IMDG Code on its website for a trial period and that the number of downloads and the number of copies of the Code which were sold would be monitored before making a final decision.

3.6.1.3 The Secretary informed the meeting the ICAO Publication Regulations would not permit such an action, because it was believed that revenue from sales of the Instructions could be impacted significantly should a freely downloadable version be available. This would in turn impact on the dangerous goods programme as many of the activities, especially training, are funded by this revenue. She would, however, raise the issue for further discussion within the Secretariat.

3.6.2 **Problems Encountered by Transport of Military Dangerous Goods by Civil Aircraft (DGP-WG/08-WP/56)**

3.6.2.1 The paper was withdrawn.

3.6.3 **DGP-WG09**

3.6.3.1 The meeting was informed of tentative plans to hold DGP-WG/09 in Auckland, New Zealand from 4 to 8 May 2009. Further information would be disseminated as soon as possible in order to facilitate travel.

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APPENDIX A

CONSOLIDATION OF AMENDMENTS TO THE TECHNICAL INSTRUCTIONS AGREED AT WG/08

Part 1

GENERAL

. . .

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:

a) articles and substances which would otherwise be classified as dangerous goods but which are required to be aboard the aircraft in accordance with the pertinent airworthiness requirements and operating regulations or that are authorized by the State of the Operator to meet special requirements;

b) aerosols, alcoholic beverages, perfumes, colognes, safety matches and liquefied gas lighters 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;

c) dry ice intended for use in food and beverage service aboard the aircraft.

DGP-WG/08-WP/6:

d) electronic devices such as electronic flight bags, personal entertainment devices, credit card readers, containing lithium metal or lithium ion cells or batteries and spare lithium batteries for such devices carried aboard an aircraft by the operator for use on the aircraft during the flight or series of flights, provided that the batteries meet the provisions of 8;1.1.2 q). Spare lithium batteries must be individually protected so as to prevent short circuits when not in use. Conditions for the carriage and use of these electronic devices and for the carriage of spare batteries must be provided in the operations manual and/or other appropriate manuals as will enable flight crew, cabin crew and other employees to carry out their responsibilities.

2.2.2 Unless otherwise authorized by the State of the Operator, articles and substances intended as replacements for those referred to in 2.2.1 a), or articles and substances referred to in 2.2.1 a) which have been removed for replacement, must be transported in accordance with the provisions of these Instructions, except that when consigned by operators, they may be carried in containers specially designed for their transport, provided such containers are capable of meeting at least the requirements for the packagings specified in these Instructions for the items packed in the containers.

2.2.3 Unless otherwise authorized by the State of the Operator, articles and substances intended as replacements for those referred to in 2.2.1 b) and c) must be transported in accordance with the provisions of these Instructions.

2.2.4 Unless otherwise authorized by the State of the Operator, battery-powered devices with installed batteries and spare batteries intended as replacements for those referred to in 2.2.1 d) must be transported in accordance with the provisions of these Instructions.

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Chapter 3

GENERAL INFORMATION

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3.1 DEFINITIONS

DGP-WG/08-WP/7 and DP/1:

Baggage. Personal property of passengers or crew carried on an aircraft by agreement with the operator.

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Part 2

CLASSIFICATION OF DANGEROUS GOODS

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Chapter 2

CLASS 2 — GASES

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2.1 DEFINITIONS AND GENERAL PROVISIONS

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DGP-WG/08-WP/8 and DP/1:

[2.1.4 Pressures of all kinds relating to receptacles (such as test pressure, internal pressure, safety-valve opening pressure) are always indicated in gauge pressure (pressure in excess of atmospheric pressure); however, the vapour pressure of substances is always expressed in absolute pressure.]

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Chapter 9

CLASS 9 — MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

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9.2 ASSIGNMENT TO CLASS 9

DGP-WG/08-WP/27 and DP/2:

[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 or that meet criteria in international regulations or national regulations established by the appropriate national authority in a ~~country~~ State of origin, transit or destination.

Substances or mixtures dangerous to the aquatic environment not otherwise classified under these Instructions~~, but classified by the shipper as dangerous goods (see Special Provision A97),~~ 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.]

Part 3

DANGEROUS GOODS LIST, SPECIAL PROVISIONS AND LIMITED AND EXCEPTED QUANTITIES

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Chapter 2

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

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DGP-WG/08-WP/2 and DP/1:

Name	*UN No.*	*Class or division*	*Subsidiary risk*	*Labels*	*State variations*	*Special provisions*	*UN packing group*	*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*
Allyltrichlorosilane stabilized	1724	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Amyltrichlorosilane	1728	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Butyltrichlorosilane	1747	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Chlorophenyltrichlorosilane	1753	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Chlorosilanes, corrosive, n.o.s.	2987	8		Corrosive		A1	II	~~808~~ FORBIDDEN	~~1 L~~	~~812~~ 8xx	30 L
Chlorosilanes, corrosive, flammable, n.o.s.	2986	8	3	Corrosive & Liquid flammable		A1	II	~~808~~ FORBIDDEN	~~1 L~~	~~812~~ 8xx	30 L
Chlorosilanes, flammable, corrosive, n.o.s.	2985	3	8	Liquid flammable & Corrosive			II	~~305~~ 3xx	1 L	~~307~~ 3xx	5 L
Chlorosilanes, toxic, corrosive, n.o.s.	3361	6.1	8	Toxic & Corrosive			II	~~609~~ 6xx	1 L	~~611~~ 6xx	30 L
Chlorosilanes, toxic, corrosive, flammable, n.o.s.	3362	6.1	3 8	Toxic & Liquid flammable & Corrosive			II	~~609~~ 6xx	1 L	~~611~~ 6xx	30 L
Cyclohexenyltrichlorosilane	1762	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Cyclohexltrichlorosilane	1763	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Dibenzylchlorosilane	2434	8		Corrosive		A1	II	~~808~~ FORBIDDEN ~~Y808~~	~~1 L~~ ~~0.5 L~~	~~812~~ 8xx	30 L
Dichlorophenyltrichlorosilane	1766	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Diethyldichlorosilane	1767	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Dimethyldichlorosilane	1162	3	8	Liquid flammable & Corrosive			II	~~305~~ 3xx	1 L	~~307~~ 3xx	5 L
Diphenyldichlorosilane	1769	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Dodecyltrichlorosilane	1771	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L

Name	UN No.	Class or division	Subsidiary risk	Labels	State variations	Special provisions	UN packing group	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
Ethylphenyldichlorosilane	2435	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Ethyltrichlorosilane	1196	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L
Hexadecyltrichlorosilane	1781	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Hexyltrichlorosilane	1784	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Methylphenyldichlorosilane	2437	8		Corrosive		A1	II	~~808~~ FORBIDDEN	~~1 L~~	~~812~~ 8xx	30 L
Methyltrichlorosilane	1250	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L
Nonyltrichlorosilane	1799	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Octadecyltrichlorosilane	1800	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Octyltrichlorosilane	1801	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Phenyltrichlorosilane	1804	8		Corrosive		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Propyltrichlorosilane	1816	8	3	Corrosive & Liquid flammable		A1	II	FORBIDDEN		~~813~~ 8xx	30 L
Silicon tetrachloride	1818	8		Corrosive		A1	II	~~808~~ FORBIDDEN ~~Y808~~	~~1 L~~ ~~0.5 L~~	~~812~~ 8xx	30 L
Trimethylchlorosilane	1298	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L
Vinyltrichlorosilane	1305	3	8	Liquid flammable & Corrosive			II	~~306~~ 3xx	1 L	~~304~~ 3xx	5 L

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Chapter 3

SPECIAL PROVISIONS

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Table 3-2. Special provisions

TIs	*UN*

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DGP-WG/08-WP/5:

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 dangerous goods which are used, for example, for medical, analytical or testing or repair purposes. 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.

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

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

b) limited quantities under 3;4.1.2.

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DGP-WG/08-WP/27 and DP/2:

[A97 These entries ~~may~~ must be used for substances which are hazardous to the environment but do not meet the classification criteria of any other class or other substance within Class 9. This must be based on the criteria as indicated in 2;9.2.1 a). This designation may also be used for wastes not otherwise subject to these Instructions but which are covered under the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal*.]

. . .

DGP-WG/08-WP/17 and DP/1:

A144 Protective breathing equipment (PBE) containing a small chemical oxygen generator for use by aircrew members may be transported on passenger aircraft in accordance with Packing Instruction 523 subject to the following conditions:

a) the PBE must be serviceable and contained in the manufacturer's original unopened inner packaging (i.e. vacuum sealed bag and protective container);

b) the PBE may only be consigned by, or on behalf of, an operator in the event that a PBE(s) has been rendered unserviceable or has been used and there is a need to replace such items so as to restore the number of PBEs on an aircraft to that required by pertinent airworthiness requirements and operating regulations;

c) a maximum of two PBE may be contained in a package;

d) the statement "Aircrew protective breathing equipment (smoke hood) in accordance with Special Provision A144" must be:

(i) included on the dangerous goods transport document;

(ii) marked adjacent to the proper shipping name on the package.

If the above conditions are met, the requirements of Special Provision A1 do not apply. All other requirements applicable to chemical oxygen generators must apply except that the "cargo aircraft only" handling label must not be displayed.

. . .

DGP-WG/08-WP/28 and DP/1:

A152 Insulated packagings containing refrigerated liquid nitrogen fully absorbed in a porous material ~~and intended for transport, at low temperature, of non-dangerous products~~ are not subject to these Instructions provided the design of the insulated packaging would not allow the build-up of pressure within the container and would not permit the release of any refrigerated liquid nitrogen irrespective of the orientation of the insulated packaging. When used to contain substances not subject to these Instructions, ~~T~~the words "not restricted" and the special provision number A152 must be provided on the air waybill when an air waybill is issued.

. . .

TIs	*UN*

DGP-WG/08-WP/59 and DP/2:

A158	(335)	Mixtures of solids which are not subject to these Instructions and ~~environmentally hazardous~~ liquids or solids ~~must be~~ classified by the shipper as environmentally hazardous substances ~~as~~ (UN 3077 and 3082) (see Special Provision A97) ~~and~~ may be transported under this entry, provided there is no free liquid visible at the time the substance is loaded or at the time the packaging is closed. Sealed packets and articles containing less than 10 mL of an environmentally hazardous liquid, absorbed into a solid material but with no free liquid in the packet or article, or containing less than 10 g of an environmentally hazardous solid, are not subject to these Instructions.

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Part 4

PACKING INSTRUCTIONS

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Chapter 4

CLASS 2 — GASES

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DGP-WG/08-WP/62 and DP/5:

200	PACKING INSTRUCTION 200	200

For cylinders, the general packing requirements of 1.1 and 4.1.1 must be met.

. . .

5) 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**

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Chapter 5

CLASS 3 — FLAMMABLE LIQUIDS

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DGP-WG/08-WP/2 and DP/2:

Packing Instruction 3xx

Passenger and cargo aircraft 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
	Plastic	Forbidden	Forbidden				
	Steel	1.0 L	5.0 L				

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes	*Drums*
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Plastic (1H2)
Plastic (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites	*Drums*	*Jerricans*
Plastic receptacle in steel drum (6HA1)	Steel (1A1)	Steel (3A1)

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Chapter 8

CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

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DGP-WG/08-WP/2 and DP/2:

Packing Instruction 6xx

Passenger and cargo aircraft 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 3361, UN 3362	Glass	1.0 L	1.0 L	1.0 L	30.0 L	No	30.0 L
	Plastic	Forbidden	Forbidden				
	Steel	1.0 L	5.0 L				

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes	*Drums*
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Plastic (1H2)
Plastic (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites	*Drums*	*Jerricans*
Plastic receptacle in steel drum (6HA1)	Steel (1A1)	Steel (3A1)

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Chapter 10

CLASS 8 — CORROSIVE SUBSTANCES

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DGP-WG/08-WP/2 and DP/2:

Packing Instruction 8xx

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 — cargo*	*Total quantity per package — cargo*	*Cargo*
UN 1724, UN 1728, UN 1747, UN 1753, UN 1762, UN 1763, UN 1766, UN 1767, UN 1769, UN 1771, UN 1781, UN 1784, UN 1799, UN 1800, UN 1801, UN 1804, UN 1816, UN 1818, UN 2434, UN 2437, UN 2986, UN 2987	Glass	1.0 L	30.0 L	30.0 L
	Plastic	Forbidden		
	Steel	5.0 L		

OUTER PACKAGINGS OF COMBINATION PACKAGINGS

Boxes	*Drums*
Fibreboard (4G)	Fibre (1G)
Natural wood (4C1, 4C2)	Plastic (1H2)
Plastic (4H1, 4H2)	Plywood (1D)
Plywood (4D)	Steel (1A2)
Reconstituted wood (4F)	
Steel (4A)	

SINGLE PACKAGINGS FOR CARGO AIRCRAFT ONLY

Composites	*Drums*	*Jerricans*
Plastic receptacle in steel drum (6HA1)	Steel (1A1)	Steel (3A1)

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Chapter 11

CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

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DGP-WG/08-WP/54 and DP/1:

904	PACKING INSTRUCTION 904	904

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Dry ice used as a refrigerant for other than dangerous goods may be shipped in a unit load device or other type of pallet prepared by a single shipper provided that the shipper has made prior arrangements with the operator. In such case, the unit load device, or other type of pallet must allow the venting of the carbon dioxide gas to prevent a dangerous build-up of pressure. The marking requirements of 5;2 and the labelling requirements of 5;3 do not apply to the unit load device. The shipper must provide the operator with written documentation stating the total quantity of the dry ice contained in the unit load device or other type of pallet.

Note.— For loading restrictions see 7;2.11; for special marking requirement see 5;2.4.7.

DGP-WG/08-WP/5:

915	**PACKING INSTRUCTION 915**	*Note.* — **9 15**

The general packing requirements of 4;1 must be met except that the requirements of 4;1.1.8 and 4;1.1.16 do not apply.

Kits may contain dangerous goods which require segregation according to Table 7-1. ~~The packing group assigned to the kit as a whole must be the most stringent packing group assigned to any individual substance contained in the kit.~~

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DGP-WG/08-WP/46 and DP/1:

916	**PACKING INSTRUCTION 916**	**916**

The general packing requirements of Part 4, Chapter 1 must be met except that the requirements of 4;1.1.2, 4;1.1.8, 4;1.1.10, 4;1.1.13 and 4;1.1.16 do not apply.

a) For other than fuel system components, machinery or apparatus may only contain one or more of the following:

1) dangerous goods permitted under 3;4.1.2; or

2) dangerous goods permitted under 3;4.1.2 and magnetized material meeting the requirements of Packing Instruction 902; ~~or~~.

~~3) gases of Division 2.2 without subsidiary risk but excluding refrigerated liquefied gases.~~

Note.— If machinery or apparatus contains only magnetized material meeting the requirements of Packing Instruction 902, it must be consigned as UN 2807.

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Part 5

SHIPPER'S RESPONSIBILITIES

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Chapter 2

PACKAGE MARKINGS

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DGP-WG/08-WP/52:

2.4.6 Special marking requirements for refrigerated liquefied gas

The upright position of each package must be indicated prominently by ~~arrows or by using~~ either the "Package orientation" label (Figure 5-26) or pre-printed package orientation labels meeting the same specification as either Figure 5-26 or ISO Standard 780-1997. The label must be affixed to or printed on at least two opposite vertical sides of the package with the arrows pointing in the correct direction. The wording "KEEP UPRIGHT" must be placed at 120° intervals around the package or on each side. Packages must also be clearly marked "DO NOT DROP — HANDLE WITH CARE".

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DGP-WG/08-WP/59 and DP/2:

2.4.9 Special marking provisions for environmentally hazardous substances

2.4.9.1 Packages containing ~~environmentally hazardous substances meeting the criteria of 2.9.3 of the UN Recommendations.~~ substances or mixtures dangerous to the aquatic environment not presenting a danger covered by other classes, but classified by the shipper as dangerous goods (UN Nos. 3077 and 3082) (see Special Provision A97) must be durably marked with the environmentally hazardous substance mark with the exception of single packagings and combination packagings containing inner packagings with:

— contents of 5 L or less for liquids; or
— contents of 5 kg or less for solids.

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Chapter 4

DOCUMENTATION

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DGP-WG/08-WP/22 and DP/2:

4.1.3 Shipper and consignee

The name and address of the shipper and the consignee of the dangerous goods must be included on the dangerous goods transport document. For the transport of radioactive material, the telephone number of the consignee, in the State of Destination, should be included.

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DGP-WG/08-WP/43 and DP/2:

4.1.5 Information required in addition to the dangerous goods description

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4.1.5.1 *Quantity of dangerous goods, number and type of packagings*

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e) for items where "No Limit" or a Packing Instruction number is shown in columns ~~11~~ 10 ~~or~~ to 13 of Table 3-1, the quantity must be:

1) ~~the net mass or volume~~ for substances the net mass or volume (e.g. UN ~~2964~~ 2969, UN 3291)~~.~~;

2) ~~F~~for articles the gross mass, followed by the letter G (e.g. UN 2794, UN 2800, UN 2990, UN 3166) ~~the quantity must be the gross mass, followed by the letter G~~.

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Part 7

OPERATOR'S RESPONSIBILITIES

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Chapter 5

PROVISIONS CONCERNING PASSENGERS AND CREW

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5.1 INFORMATION TO PASSENGERS

5.1.1 An operator must ensure that information on the types of dangerous goods which a passenger is forbidden to transport aboard an aircraft is provided with the passenger ticket or made available in another manner to passengers prior to the check-in process.

5.1.2 An operator or the operator's handling agent and the airport operator must ensure that notices warning passengers of the types of dangerous goods which they are forbidden to transport aboard an aircraft are prominently displayed, in sufficient number, at each of the places at an airport where tickets are issued, passengers are checked in and aircraft boarding areas are maintained, and at any other location where passengers are checked in. These notices must include visual examples of dangerous goods forbidden from transport aboard an aircraft.

Note.— Existing notices that do not include visual examples of dangerous goods may continue in place until 31 December 2009 after which time the requirements specified above will apply.

DGP-WG/08-WP/13 and DP/3:

5.1.3 An operator, of passenger aircraft, should have information on those dangerous goods which may be carried by passengers in accordance with 8;1.1.2, available prior to the check-in process on their web sites or other sources of information.

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Part 8

PROVISIONS CONCERNING PASSENGERS AND CREW

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Chapter 1

PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

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1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

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1.1.2 Notwithstanding any additional restrictions which may be implemented by States in the interests of aviation security, except for the incident reporting provisions of 7;4.4, the provisions of these Instructions do not apply to the following when carried by passengers or crew members or in baggage that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage):

. . .

Medical necessities

. . .

DGP-WG/08-WP/49 and DP/4:

e) with the approval of the operator(s), wheelchairs or other battery-powered mobility aids with non-spillable batteries (see Packing Instruction 806 and Special Provision A67), as checked baggage provided the battery terminals are protected from short circuits [(e.g. by being enclosed within a battery container)] and the battery is securely attached to the wheelchair or mobility aid. [The operator(s) must ensure that wheelchairs or other battery powered mobility aids are carried in such a manner so as to prevent unintentional activation and that they are protected from being damaged by the movement of baggage, mail, stores or other cargo];

. . .

Consumer articles

. . .

DGP-WG/08-WP/45 and DP/5:

q) ~~consumer~~ portable electronic devices (watches, calculating machines, cameras, cellular phones, laptop computers, camcorders, etc.) containing lithium or lithium ion cells or batteries when carried by passengers or crew for personal use, which should be carried as carry-on baggage. 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 carried in carry-on baggage only. In addition, each installed or spare battery must not exceed the following:

— for lithium metal or lithium alloy 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.

With the approval of the operator, lithium ion batteries exceeding a watt-hour rating of 100 Wh but not exceeding 160 Wh may be carried as spare batteries in carry-on baggage or in equipment in either checked or carry-on baggage. No more than two individually protected spare batteries per person may be carried.

DGP-WG/08-WP/11 and DP/4:

v) Energy efficient light bulbs when in retail packaging intended for personal or home use.

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Attachment 2

GLOSSARY OF TERMS

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Glossary of terms

Term and explanation	*UN Number(s), when relevant*
. . .	
FRACTURING DEVICES, EXPLOSIVE, for oil wells, without detonator. Articles consisting of a charge of detonating explosive contained in a casing without means of initiation. They are used to fracture the rock around a drill shaft to assist the flow of crude oil from the rock.	0099
DGP-WG/08-WP/3 Revised and DP/1:	
FUEL CELL. A fuel cell is an electrochemical device that converts the chemical energy of a fuel to electrical energy, heat and reaction products.	
FUEL CELL CARTRIDGE. An article that stores fuel for discharge into the fuel cell through a valve(s) that control the discharge of fuel into the fuel cell.	3473, 3476, 3477, 3478, 3479
FUSE/FUZE. Although these two words have a common origin (French fusée, fusil) and are sometimes considered to be different spellings of the same word, it is useful to maintain the convention that FUSE refers to a cord-like igniting device whereas FUZE refers to a device used in ammunition which incorporates mechanical, electrical, chemical or hydrostatic components to initiate a train by deflagration or detonation.	—
. . .	

— END —