International Civil Aviation Organization

DANGEROUS GOODS PANEL

NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

REPORT FOLDER

The material in this report has not been considered by the Air Navigation Commission. The views expressed therein should be taken as advice of a panel of experts to the Air Navigation Commission but not as representing the views of the Organization. After the Air Navigation Commission has reviewed this report a supplement setting forth the

action taken by the Air Navigation Commission thereon will be issued to this report.

DANGEROUS GOODS PANEL (DGP)

REPORT OF THE NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

GENERAL

The attached constitutes the general part of the report and should be inserted at the appropriate place in the yellow report folder.

(10 pages)

REPORT OF THE NINETEENTH MEETING OF THE DANGEROUS GOODS PANEL (DGP) (2003)

LETTER OF TRANSMITTAL

To: President, Air Navigation Commission

From: Chairman, Dangerous Goods Panel (DGP) (2003)

I have the honour to submit the report of the nineteenth meeting of the Dangerous Goods Panel which was held in Montreal from 27 October to 7 November 2003.

J. Code
Chairwoman

Montreal, 7 November 2003

TABLE OF CONTENTS

Page

LIST OF RECOMMENDATIONS*

— — — — — — — —

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

DANGEROUS GOODS PANEL (DGP)

REPORT OF THE NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

HISTORY OF THE MEETING

1. DURATION

1.1 The nineteenth meeting of the Dangerous Goods Panel (DGP/19) was opened by Mr. Daniel Galibert, President of the Air Navigation Commission in Montreal at 1000 hours on 27 November 2003. The meeting ended on 7 November 2003.

2. ATTENDANCE

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

Members	Advisers	Nominated by
P. Steele	L. Willoughby	Australia
M. Hinoul	K. Vermeersch	Belgium
P.C.C. Guerreiro Lima	L. Jawerbaum	Brazil
	J. Vieira	
J.I. Code	D. Evans	Canada
	S. Garneau	
	L. Hume-Sastre	
	J. Marriott	
	J. Peete	
	D. Sylvestre	
J. Le Tonqueze	Y. Guarguir	France
H. Brockhaus	R. Auschra	Germany

Members	Advisers	Nominated by
	P. Blümel	
	T. Ezel	
	C. Fasten	
	M. Philippi	
	V. Thurm	
A. Ventresca	M. Apolloni	Italy
	A. Furia	
H. Nakagawa	S. Maruo	Japan
	S. Mikawa	
D.E. Raadgers	S. Hassing	Netherlands
	S. Oosterhoff	
M.W. Evans		New Zealand
Y.A. Mikhin	Y. Malyshev	Russian Federation
	V. Korovkin	
	D. Kurdchenko	
S.O. Sánchez Serrano		Spain
O. Alameri	L. Armen	United Arab Emirates
G. Leach	R. Castle	United Kingdom
	D. Elbourne	
	J. Hart	
	R. Wells	
R.A. Richard	J. Gale	United States
	J. McLaughlin	
	S. Nesby-O'Dell	
J. Abouchaar	P. Balasubramanian	IATA

	D. Brennan	
	M. Craig	
	P. Oppenheimer	
Members	**Advisers**	**Nominated by**
W. Schuurman	L. Farris	IFALPA
	R. Gierlings	
Advisers		
G. Dicke		IAEA
A. Altemos		DGAC
R. Klein		
M. Morrissette		
D. Warden		
S. Benessai		UNCOETDG
N. Previsani		WHO
Observers		
JIANG, Rui		China
XIE, Xing-Quan		
PANG, Wing Sze		
WU, K.		
C. Aygün		Turkey
T. Büyükikiz		
A.E. Ertuþ		
A. McCulloch		IECC
T. Dixon		WNTI
Others		
L. Ribeiro		ANC Commissioner

E. Sanchez Ara	ANC Commissioner
M. Comber	ANC Commissioner
P. Ciancaglioni	Alternate Representative of Italy on the Council

Others

M.Tupamaki	Alternate Representative of Sweden on the Council
G. Mahdavi	Representative of Iran to ICAO
A. Gungah	Representative of Mauritius on the Council of ICAO
B. Gueye	Representative of Senegal on the Council of ICAO
P. Avila	Alternate Representative of Peru to ICAO

3. OFFICERS AND SECRETARIAT

3.1 Mrs. J. Code was elected Chairman of the meeting.

3.2 The Secretary of the meeting was Dr. Katherine Rooney, Technical Officer of the Operations/Airworthiness Section, who was assisted by Mr. L. Mortimer.

3.3 Interpretation and translation were provided in 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 21 January 2003.

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 incorporation in the 2005/2006 edition

Agenda Item 3: Resolution, where possible, of the non-recurrent work items identified by the Commission or the panel

3.1: Principles governing the transport of dangerous goods on cargo only aircraft

3.2: Reformatting of the packing instructions

3.3: Dangerous goods guidance material for security personnel

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

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

6.1 Good morning ladies and gentlemen.

This is the nineteenth meeting of the Dangerous Good Panel.

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

Subsequent to the eighteenth meeting of the panel held in October 2001, the Commission considered your report and recommended to the Council the acceptance of all your recommendations. The Council adopted Amendment 7 to Annex 18 on 24 February 2003; the amendment became effective on 14 July 2003 and will become applicable on 27 November 2003. In addition the Council approved the amendments for the 2003-2004 Edition of the Technical Instructions to be applicable from 1 January 2003.

Another of your recommendations was supported by the Commission and that concerns the inclusion of Annex 18 in the list of Annexes that should be audited under the ICAO Safety Audit programme or USOAP. In this respect, the situation is less clear: The Council has already decided to expand the audits in 2004 to Annexes 11, 13 and 14. However, for obvious budgetary reasons, ICAO is unlikely, in the future, to pursue that expansion on an Annex-by-Annex basis. The next Assembly will have to consider the adoption of a so-called “systems approach” whereby all ICAO documents will be considered and all inter-related safety provisions will be audited. Future audits are also likely to concentrate on States ability to fulfill their safety oversight obligations. So, although the subject is still open to discussion, one can say that your proposal has duly been considered and that Annex 18 should be included in the new - yet to be defined - auditing process.

Since the eighteenth meeting, there have been a number of changes in membership. Miss Warner and Messrs. Wybenga, Puente and Oosterhoff have left the panel, and the Commission is grateful for the contribution they made. In their places, you have been joined by Ms. Raadgers nominated by the Netherlands, Mr. Sánchez-Serrano nominated by Spain, Mr. Richard nominated by the United States and Mr. Leach nominated by the United Kingdom. The Air Navigation Commission has also approved the addition of two new members, Mr. Evans nominated by New Zealand and Mr. Alameri nominated by the United Arab Emirates. I bid you, new members, welcome to the panel.

I have just referred to Miss Warner. As you are probably aware, I had the honour to present Miss Warner, on behalf of the Commission, the third Laurel Award in recognition of her outstanding contribution to the safety, regularity and efficiency of international civil aviation in the field of dangerous goods. The presentation was carried out, in front of quite a big audience, during the Eleventh Air Navigation Conference. In her acceptance speech, Miss Warner commented that the award recognized all of the work that the panel had done over the years and, on her behalf, I thank you.

During the next days you will be meeting in a panel framework. I would like, as usual, to remind each member that you are here in a personal expert capacity representing your own professional views, which may not necessarily be the same as 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 and CNS/ATM systems, there should be a minimum three-year cycle between Annex amendments.

The second task of this meeting is to recommend necessary revisions to the Technical Instructions for incorporation into the 2005-2006 Edition. Please, remember the word “necessary” and I ask you all to bear in mind that every change imposes some burden on those who have to use this document. Having said that, I realize that the vast majority of amendments arise from aligning the Technical Instructions with the United Nations Recommendations which, in the interests of multimodal harmonization, is essential.

The final agenda item concerns the various non-recurrent tasks which have been identified by the Commission and by the panel. The issue of developing dangerous goods guidance material for security personnel is certainly a very important one. Your contribution in this respect will be very helpful. I know that you will also discuss the proposed incorporation of provisions for the security of dangerous goods in transport. I look forward to hearing the outcome of your discussions.

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 your previous meetings. If you should 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. We will anyway meet again towards the end of your meeting for an informal debriefing on your achievements. I understand that should take place in the afternoon of the last Friday and the Commissioners and myself look forward to listening to your chairman on that occasion.

It remains for me to declare open, then, the Nineteenth Meeting of the Dangerous Goods Panel, to wish you every success in your work and to express my hope that you will enjoy a pleasant stay in Montreal.

— — — — — — — —

DANGEROUS GOODS PANEL (DGP)

NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

AGENDA ITEM 1

The attached constitutes the report on Agenda Item 1 and should be inserted at the appropriate place in the yellow report folder.

(12 pages)

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

1.1 INFORMATION IN THE EVENT OF AN AIRCRAFT ACCIDENT OR INCIDENT(DGP/19-WP/28)

1.1.1 A member recalled discussions during the Working Group 03 meeting on a proposed amendment to 9.6.1 of Annex 18 and to Part 7;4.6.1 of the Technical Instructions concerning the application of the Annex 13 definition for 'serious incident'. These paragraphs dealt with the provision of information by the operator concerning dangerous goods on board an aircraft in the event of an accident or serious incident.

1.1.2 The working group had agreed that it would be unnecessary for the operator of an aircraft involved in a 'serious incident' to provide any information related to the dangerous goods cargo if emergency services had not found it necessary to respond.

1.1.3 However, it was now suggested that the discussion had not addressed the additional provision in the last sentence: 'As soon as possible, the operator must also provide this information to the appropriate authorities of the State of the Operator and the State in which the accident or serious incident occurred.'

1.1.4 It was therefore being proposed that, if the meeting endorsed the Working Group's view, it should reflect this opinion formally in the report of DGP/19. Alternatively, if the Panel believed the affected States must be notified, in the case of a serous incident whether or not emergency response services responded, then consideration should be given to amending 9.6.1 of Annex 18 and Part 7; 4.6.1 of the Technical Instructions.

1.1.5 It was pointed out that care was needed not to lose the intent of these paragraphs which was that emergency services be made aware of dangerous goods on board in the case of any accident, whether the dangerous goods were involved or not. The same did not necessarily apply in the case of serious incidents, where information on dangerous goods was only necessary when the dangerous goods were in some way involved.

1.1.6 It was therefore agreed to restructure the paragraph to separate the actions required by the operator in the case of accidents and serious incidents. It was also agreed that the Secretary should add similar text in the appropriate location in the Technical Instructions.

1.2 SECURITY PROVISIONS FOR RADIOACTIVE MATERIAL

It was recalled that, in December 2002, IAEA had presented to the UNSCETDG provisions relating to the security during transport of radioactive materials. These provisions were based on information available at that time and were considered for inclusion in appropriate ICAO documents (including possibly Annex 18). The meeting was informed however that the IAEA provisions still only had the status of guidance material and that they should not be included in either Annex 18 or the Technical Instructions for the time being.

1.3 THE SECURITY OF DANGEROUS GOODS IN TRANSPORT

1.3.1 Background

1.3.1.1 It was recalled that, as a result of the terrorist attacks, many governments and international organizations had undertaken a broad review of dangerous goods transport security requirements. The United Nations Committee of Experts on the Transport of Dangerous Goods and the Globally Harmonized System of Labeling and Classification of Chemicals had consequently adopted security measures (included in the 13th revised edition of the UN Model Regulations) to address the potential misuse of dangerous goods by terrorists. Other modes of transport and national governments are taking action to incorporate dangerous goods security requirements; dangerous goods security measures have been adopted in the RID/ADR/ADN and in the US Hazardous Materials Regulations (HMR). The International Maritime Organization (IMO) has adopted the text in principle.

1.3.1.2 The incorporation of the UN recommendations into ICAO documentation had already been discussed at an informal meeting in early September (report is contained in DGP/19-WP/37). It had become apparent that there was a difference in opinion between some members concerning which ICAO documents the provisions should be placed in. The choice was between placing the majority of the material in Annex 17 and the Security Manual or in Annex 18 and the Technical Instructions. The principal arguments presented for each of these options are described in the following paragraphs. The opinion of the ICAO Secretariat's legal experts was also presented.

1.3.2 The case for Annex 17 and the Security Manual (DGP/19-WP/38)

1.3.2.1 It was pointed out that ICAO already had security provisions (unlike some of the other modes). These provisions dealt with the security of aviation operations, including the hijacking of aircraft, unlike Annex 18 and the Technical Instructions which fundamentally dealt with the properties of dangerous goods. Moreover, ICAO had a consultative body, the Aviation Security (AVSEC) Panel, to advise on security matters, parallel to the DGP to advise on the transport of dangerous goods. However, the members of DGP were not experts in matters of aviation security and it was preferable to refer this matter to security experts, even though dangerous goods could, possibly, be involved.

1.3.2.2 It was noted that the Security Manual contained only guidance material, and, for practical purposes, the UN text was only guidance. Its provisions were often too vague to be enforceable as regulatory material, which would be a difficulty if they were to be included in the Technical Instructions. In any case, placing provisions in the Technical Instructions because they would be more enforceable would not be adequate grounds for placing them in a fundamentally inappropriate document.

1.3.2.3 Furthermore, it was not believed that a perceived need for haste in publishing provisions for the air mode should be a reason for locating the provisions in an inappropriate document. A suggestion had been made to adopt a two-stage approach – placing provisions in Annex 18 and the Technical Instructions initially and transferring them to Annex 17 and the Security Manual as time and opportunity permitted. However, if this were done it was doubted that the second stage would ever be implemented.

1.3.3 **The case for Annex 18 and the Technical Instructions (DGP/19-WP/39)**

1.3.3.1 The UNSCETDG had stressed the need for urgency in applying its recommendations and Annex 18 and the Technical Instructions appeared to offer the fastest way for ICAO to comply. In this context, it was noted that the other modes of transport had, essentially, already complied.

1.3.3.2 Annex 17 did not address the security of cargo aircraft, on which shipments of the more hazardous dangerous goods travelled. This could be changed, but would doubtless be a lengthy process. Furthermore, Annex 18 and the Technical Instructions addressed the whole transport chain: Annex 17 would, for example, not address shippers.

1.3.3.3 Although Annex 17 was readily available, the Security Manual was a restricted document (unlike the Technical Instructions) and that was therefore another reason why provisions in the manual might never reach the intended audience.

1.3.3.4 The legal status of the Technical Instructions was much more favourable for enforcement than the Security Manual. The provisions of the Technical Instructions normally passed fairly rapidly into national legislation whereas the provisions of the Security Manual were only for guidance.

1.3.3.5 The established revision schedule for the Technical Instructions would allow amendments to the provisions to be made in a more timely fashion since AVSECP did not meet as frequently or regularly as DGP. The Technical Instructions amendment cycle is in phase with that of the UN Recommendations, and furthermore, incorporation of the provisions in the Technical Instructions and Annex 18 should result in better consistency with the other modes of transport.

1.3.3.6 Taking these points into account, it was suggested that the provisions should be placed, at least initially, in Annex 18 and the Technical Instructions. They could be moved at a later date into Annex 17 and the Security Manual.

1.3.4 **Advice from the ICAO Legal Bureau (DGP/19-WP/42)**

1.3.4.1 A number of questions of a legal nature had been raised at the working group meeting on this subject referred to in 1.3.1.2 above and these were addressed at this meeting as follows:

a) on the question of whether ICAO should incorporate the UN Recommendations into appropriate ICAO documents, it was considered that ICAO's jurisdiction concerning the safety of international civil aviation was extensive and the recommendations of the UNSCETDG certainly appeared to deal with the safety of aviation. Furthermore, it had been a long-standing practice to incorporate the UN's Recommendations into ICAO documents;

b) as to whether ICAO could adapt the UN Recommendations for international civil aviation, again ICAO has habitually adapted these general all-mode provisions to the special needs of the aviation mode. There was no reason to believe that ICAO should

not make adaptations in the case of the security recommendations, should that be necessary; and

c) on the subject of where the provisions should be placed in ICAO documentation, it was noted this was ultimately the decision of the Council, taking account of the advice of bodies such as DGP, through the Air Navigation Commission and other ICAO bodies as appropriate.

While Annex 17 (together with the Security Manual) incorporates the core matters concerning the security of international civil aviation, there were precedents for specific security provisions being placed in other Annexes. In view of past UN Recommendations having been placed in Annex 18 and the Technical Instructions, the fact that shippers are reached through the Technical Instructions and the Technical Instructions shorter amendment cycle, the Bureau's recommendation would be to include the UN Recommendation on security in Annex 18 and the Technical Instructions.

1.3.5 View of the AVSEC Panel

1.3.5.1 The meeting benefitted from the presence of a representative of the ICAO AVSECP who was able to offer an AVSECP perspective on the matter. He reported that AVSECP members had been asked for their views on which ICAO document should be used. Of the seven members responding, three had preferred Annex 17/Security Manual, one had preferred Annex 18/Technical Instructions and three had preferred Annex 18/Technical Instructions now with a possible transfer to Annex 17/Security Manual in the future. It was evident that further discussion in AVSECP was needed on several issues, including the regulating of shippers, addressing cargo aircraft in Annex 17 and the possibility of the two stage approach (i.e. Annex 18/Technical Instructions initially, transferring to Annex 17/Security Manual at some later date). In summary he believed there was no consensus in the AVSECP for either option at present.

1.3.5.2 From the practical viewpoint, and in view of the urgency of the matter, he pointed out that AVSEC was scheduled to hold a relatively short meeting in May 2004 at which a number of relatively mature amendments to Annex 17 were due to be considered. It was therefore very doubtful that there could be an in-depth consideration of the issues involved (e.g. re shippers and cargo aircraft) at this forthcoming meeting. It also had to be expected that AVSECP would not find this subject any easier to deal with than had DGP.

1.3.6 Discussion

1.3.6.1 Some members commented that security concerns now touched all aspects of work in aviation and other fields. It was no longer realistic to think that either security or the transport of dangerous goods could be viewed as separate disciplines. This fact had to be recognized at the national level and also at the international level. Concerning the precision of the UN requirements and their suitability for regulatory material, it was suggested that they had been deliberately drafted to allow the greatest flexibility in their application.

1.3.6.2 Other members expressed the view that clear regulations were essential. It was considered that the security of dangerous goods was a completely different matter to the safe transport of dangerous goods and that dangerous goods authorities might have great difficulty enforcing security regulations which

would much more effectively be done by security experts. The threat involved was not necessarily to aviation, but arose from the misuse of stolen dangerous goods.

1.3.6.3 After further discussion, the meeting decided, by a small majority, to place the provisions in Annex 18 and the Technical Instructions. The meeting agreed to seek AVSECP's views on whether this should be a permanent or a transitional arrangement, and requested its views as soon as possible. The meeting underscored the need for close cooperation between AVSECP and DGP in this work. The need for adequate cross-references between the dangerous goods and security documents was stressed. In this context, it was noted that provisions from other Annexes relating to security were routinely included as guidance in Annex 17 and this practice would presumably be followed in the case of any amendments to Annex 18 and possibly the Technical Instructions.

1.3.6.4 In light of these discussions, the meeting developed the following recommendation:

Recommendation 1/1 —
Inclusion of Security Provisions in Annex 18 and the Technical Instructions

That:

a) ICAO should agree that the Recommendations of the United Nations Sub Committee on the Transport of Dangerous Goods concerning security, after adaptation as necessary to the requirements of air transport, be placed in Annex 18 — *The Safe Transport of Dangerous Goods by Air* and the Technical Instructions;

b) The ICAO Aviation Security Panel be requested to cooperate as necessary with the Dangerous Goods Panel in this work and also consider at its earliest convenience whether these security-related provisions should eventually be transferred to Annex 17 — *Security — Safeguarding International Civil Aviation against Acts of Unlawful Interference* and the Security Manual.

1.3.6.5 On the assumption that ICAO would accept the preceding recommendation, the meeting developed an amendment to Annex 18 based on the UNSCETDG recommendations. The amendment consists of a definition of dangerous goods security and a new Chapter 13 requiring States to establish dangerous goods security measures.

1.3.6.6 The meeting also developed complementary provisions for the Technical Instructions. Because of the difficulties that some members envisaged in enforcing such provisions in their States through their dangerous goods legislation, it was agreed to give the provisions only the status of recommendation. A new Chapter 5 to Part 1 of the Technical Instructions was developed, covering general security provisions, training and security plans.

1.3.6.7 It was pointed out that the Indicative List of High Consequence Dangerous Goods included substances which were forbidden for transport by air under any circumstances. It was stated that this was because it was an inter modal list and, moreover, some of the forbidden substances could be carried by air through the exemption process. It was agreed to add a Note to the new Chapter 5 to indicate that all the provisions of Chapter 5 needed to be taken into consideration when granting exemptions. The same note would also be placed in the Supplement to the Technical Instructions.

1.3.6.8 It was reiterated that the meeting's decisions concerning security should be passed to the AVSEC Panel for its information, together with the proposals for the amendment of Annex 17 contained in DGP/19-WP/38.

1.4 RECOMMENDATIONS

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

RSPP

Recommendation 1/2 — Amendment to Annex 18 — *The Safe Transport of Dangerous Goods by Air*

That Annex 18 be amended as indicated in Appendix A to this part of the report.

Recommendation 1/3 — Amendment to the Technical Instructions

That the Technical Instructions be amended as indicated in Appendix B to this part of the report.

— — — — — — — —

APPENDIX A

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR

**ANNEX 18
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

. . .

CHAPTER 1. DEFINITIONS

Dangerous goods security. For the purposes of this Annex, dangerous goods security means measures or precautions to be taken by operators**,** shippers and others involved in the transport of dangerous goods aboard aircraft to minimize theft or misuse of dangerous goods that may endanger persons or property.

. . .

CHAPTER 9. PROVISION OF INFORMATION

. . .

9.6 Information in the event of an aircraft accident or incident

9.6.1 In the event of:

a) an aircraft accident; or

b) a serious incident where dangerous goods carried as cargo may be involved,

the operator of ~~an~~ the aircraft carrying dangerous goods as cargo shall provide information, without delay, to emergency services responding to the accident or serious incident about the dangerous goods on board, as shown on the written information to the pilot-in-command. As soon as possible, the operator shall also provide this information to the appropriate authorities of the State of the Operator and the State in which the accident

or serious incident occurred.

. . .

CHAPTER 13. DANGEROUS GOODS SECURITY PROVISIONS

Each Contracting State shall establish dangerous goods security measures applicable to shippers**,** operators**,** consignors and other individuals engaged in the transport of dangerous goods by air to be taken to minimize theft or misuse of dangerous goods that may endanger persons or property. These measures should be commensurate with security provisions specified in other Annexes and the Technical Instructions.

— — — — — — — —

APPENDIX B

PROPOSED AMENDMENT TO THE *TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR* (DOC 9284)

. . .

PART 1. GENERAL

CHAPTER 3. GENERAL INFORMATION

. . .

Dangerous goods security. Measures or precautions to be taken by operators**,** shippers and others involved in the transport of dangerous goods aboard aircraft to minimize theft or misuse of dangerous goods that may endanger persons or property.

. . .

Chapter 5

DANGEROUS GOODS SECURITY

Note 1. – This Chapter addresses the security responsibilities of operators, shippers and others involved in the transport of dangerous goods aboard aircraft. It should be noted that Annex 17 provides comprehensive requirements for implementation of security measures by States to prevent unlawful interference with civil aviation or when such interference has been committed. In addition, the Security Manual for Safeguarding Civil Aviation against Acts of Unlawful Interference *(Doc 8973 - Restricted) provides procedures and guidance on aspects of aviation security and is intended to assist States in the implementation of their respective national civil aviation security programmes. The requirements in the Chapter are intended to supplement the requirements of Annex 17 and to implement measures to be taken to minimize theft or misuse of dangerous goods that may endanger persons or property. The provisions of this Chapter do not supercede requirements of Annex 17 or the Security Manual.*

5.1 GENERAL SECURITY PROVISIONS

5.1.1 All persons engaged in the transport of dangerous goods should consider security requirements for the dangerous goods commensurate with their responsibilities.

5.1.2 Dangerous goods should only be offered to operators that have been appropriately identified.

5.2 SECURITY TRAINING

5.2.1 The training specified in 1;4.2 should include elements of security awareness.

5.2.2 Security awareness training should address the nature of security risks recognizing security risks methods to address and reduce such risks and actions to be taken in the event of a security breach. It should include awareness of security plans (if appropriate) commensurate with the responsibilities of individuals and their part in implementing security plans.

Note.— Persons that have received security training in accordance with the requirements of a National Security Plan or other security requirements that fulfil the elements of 5.2.2 need not receive additional training.

5.2.3 Such training should be provided or verified upon employment in a position involving dangerous goods transport. Recurrent training should take place within 24 months of previous training to ensure knowledge is current.

5.2.4 Records of all security training undertaken should be kept by the employer and made available to the employee if requested.

5.3 SECURITY PLANS

5.3.1 Operators, shippers and others engaged in the transport of high consequence dangerous goods (see Table 1-5) should adopt, implement and comply with a security plan that addresses at least the elements specified in 5.3.2.

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

a) specific allocation of responsibilities for security to competent and qualified persons with appropriate authority to carry out their responsibilities;

b) records of dangerous goods or types of dangerous goods transported;

c) 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.

Table 1-5. Indicative List of High Consequence Dangerous Goods

High consequence dangerous goods are those which have the potential for mis-use in a terrorist incident and which may, as a result, produce serious consequences such as mass casualties or mass destruction. The following is an indicative list of high consequence dangerous goods:

Class 1 Division 1.1 explosives
Class 1 Division 1.2 explosives
Class 1 Division 1.3 compatability group C explosives
Division 2.3 toxic gases (excluding aerosols)
Division 6.1 substances of Packing Group 1; except when transported under the excepted quantity provisions in 1;2.4
Division 6.2 infectious substances of Category A; and
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.

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

— — — — — — — —

DANGEROUS GOODS PANEL (DGP)

NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

AGENDA ITEM 2

The attached constitutes the report on Agenda Item 2 and should be inserted at the appropriate place in the yellow report folder.

(163 pages)

Agenda Item 2 : Development of recommendations for amendments to the Technical Instructions for incorporation in the 2005/2006 edition

2.1 AMENDMENTS TO THE TECHNICAL INSTRUCTIONS TO ALIGN WITH THE UN RECOMMENDATIONS (DGP/19-WP/2, 3, 4, 5, 6, 7, 8, 9 and 53)

2.1.1 The meeting reviewed amendments to the Technical Instructions to reflect the decisions taken by the UN Sub-Committee of Experts on the Transport of Dangerous Goods (UNSCETDG) at the first session (Geneva, 11 to 13 December 2002). It was noted that these changes had already been reviewed and modified at the meetings of the DGP Working Group of the Whole (Montreal, 5 to 9 May 2003). Further discussions on amendments to the individual Parts of the Technical were as indicated in the following paragraphs.

2.1.2 Part 1 (DGP/19-WP/2)

2.1.2.1 It was questioned whether it was appropriate in paragraph 1;1.3.2.6 of the Technical Instructions to include a reference to the consignee since it was questionable whether dangerous goods legislation would have jurisdiction over consignees. The preliminary view of the ICAO Legal Bureau was that since the Annex 18 definition of consignment refers to the consignee, the dangerous goods regulations could be applied to consignees. The meeting was informed that consignees were covered by the International Atomic Energy Agency (IAEA) regulations. If difficulties in this respect were being encountered at the national level, it was suggested that they could be addressed by cooperative efforts between the radioactive material and dangerous goods transport authorities. The subject should also be raised with the UNSCETDG. It was also noted that the expression "non-compliance" could have a range of meanings in relation to radioactive materials. The meeting was subsequently provided, for information, with draft guidance material being prepared by IAEA on this subject. Doubt was also expressed concerning the meaning of "relevant competent authority".

2.1.2.2 The use of the expression "infectious substances" in paragraph 2.3.2 a) was questioned, since Category A infectious substances were not allowed in the mail. It was agreed that the terminology in this area could be confusing since diagnostic specimens came under the general definition of infectious substances, but would be dealt with differently from other types of infectious substances. It was agreed to return to this subject during the general discussion of infectious substances.

2.1.2.3 It was agreed to amend the definition of "Freight forwarder" (paragraph 3.1.1) by adding "or organization" after "person".

2.1.2.4 It was pointed out that the new provisions of 1.3.2.6.1 a) relating to radioactive material, places a responsibility on a consignee to inform the shipper of a non-compliance in respect of radiation level or contamination. However, there is no requirement for the consignee to inform the operator of such a non-compliance. It was suggested that this was a significant omission, particularly in respect of contamination,

when the operator may need to implement the decontamination requirements of 7; 3.2. An amendment to 1.3.2.6.1 a) was therefore proposed. The meeting agreed with the proposal.

2.1.3 **Part 2 (DGP/19-WP/3)**

2.1.3.1 An apparent contradiction between paragraphs 7.1.2 b) and 7.9.3 b) ii) concerning consumer products was noted and it was agreed to return to this later in the meeting.

2.1.3.2 The reference to paragraph 2.9.3 of the UN Recommendations in paragraph 9.2.1 a) was questioned. It was explained that it had been agreed at the working groups not to include the full UN text in certain cases in the Technical Instructions but to use a cross-reference instead. It was, however, pointed out that the International Maritime Organization (IMO), and subsequently ADR/RID, had not adopted this UN Recommendation for the time being. This was because of downstream effects, which had yet to be resolved, and not because of any difficulty with the classification criteria. It was agreed that multi-modal consistency should be maintained and that the Technical Instructions should not refer to 2.9.3 of the UN Recommendations for the time being. Instead, it was agreed to include a cross-reference to special provision (SP) A97, which, as amended, gave more guidance on the substances to be included. It was suggested that SP A97 could include the reference to paragraph 2.9.3.

2.1.4 **Part 3 (DGP/19-WP/4)**

2.1.4.1 It was verified that the figure of 100 kg gross mass in SP A51 was acceptable.

2.1.4.2 It was agreed to reconsider SP A81 as part of the general discussion on infectious substances.

2.1.4.3 Concerning SP A88, a member questioned whether it was necessary, based on experience in his State, to require approval for prototype lithium batteries. He suggested reviewing this matter in the panel's future work.

2.1.4.4 In SP A97, it was agreed not to delete the first sentence, concerning designation by the national authority, now that the reference in 9.2.1 a) to UN paragraph 2.9.3 had been removed. It was further agreed to delete the reference to meeting criteria for environmentally hazardous substances, since these did not yet exist in the Technical Instruction. It was also agreed that the text of SP A97 was internally inconsistent and the use of "must" (3rd line) was consequently changed to "may" and to delete the words "which do not meet the criteria for an environmentally hazardous substance according to these Instructions or for any other hazard Class".

2.1.4.5 It was suggested that the words "as used in spark ignition engines" should be removed from SP A100, as had been discussed at the UNSCETDG. It was agreed to await a UN decision on this point.

2.1.4.6 It was agreed to discuss SP A141 as part of the broader topic of infectious substances.

2.1.5 **Part 4 (DGP/19-WP/5)**

It was questioned whether, in light of the new packing instruction (PI) P2XX, the Technical Instructions would continue to include the existing PI P202. It was pointed out that the new PI P2XX appeared to deal only with closed receptacles for cryogenic liquids whereas PI 202 dealt with open receptacles and it appeared that it should therefore be retained. It was agreed to retain PI 202 for the time being and not to include PI P2XX. The question of the need for a review of the open receptacle case would be brought before the UNSCETDG.

2.1.6 **Part 5 (DGP/19-WP/6)**

2.1.6.1 It was noted that the new paragraph 2.4.9 c) was another instance where the use of "diagnostic specimen" needed to be reviewed as part of the general discussion on infectious substances.

2.1.6.2 It was pointed out that there was a potential discrepancy between paragraph 3.4.1.1 d) and 3.2.8 concerning the overlapping of labels.

2.1.6.3 The meeting reviewed the UN's proposed revised text for Packing Instruction 620 - which would replace Packing Instruction 602 in the Technical Instructions. The text was generally agreed with minor amendments. It was agreed to keep the number 602 for the revised packing instruction for the time being and to change to 620 when the new packing instruction system was introduced.

2.1.7 **Part 6 (DGP/19-WP/7)**

It was agreed that paragraph 3.1.5.6 needed to be reviewed in light of the decision not to include PI P2XX (see 2.1.5 above).

2.1.8 **Part 7 (DGP/19-WP/8)**

2.1.8.1 It was agreed to defer a decision of paragraph 1.2 until the general discussion on infectious substances.

2.1.8.2 It was also agreed to amend the first line of paragraph 3.2.4 to delete the words "or opening" and to simplify the text to make it only applicable to operators.

2.1.8.3 The proposed new paragraph 3.1.5 caused some discussion. Some members thought that it was unreasonable to require cargo holds to be inspected whenever infectious substances had been carried if there was no other evidence of leakage. In any case the requirement appeared to be already covered by paragraph 3.1.3. On the other hand, it was thought that the new paragraph 3.1.5 would ensure that cargo holds were always inspected since leaking packages, and consequent cargo hold contamination, might not be discovered until the aircraft had departed on its next flight. The discussion again highlighted the question of terminology and it was agreed to defer further consideration until the general subject of infectious substances was addressed.

2.1.9 **Part 8 (DGP/19-WP/9)**

The proposed changes were agreed without further comment.

2.1.10 **The Dangerous Goods List (Table 3-1) (DGP/19-WP/53)**

2.1.10.1 The meeting noted the proposed changes to the dangerous goods list arising from the decisions of the UNSCETDG and as modified at DGP working group meetings. The meeting also noted the proposed Packing Instructions and quantity limits (based on the Tables in the Supplement) for the new commodities added by the UNSCETDG.

2.1.10.2 The meeting agreed that it could not give these proposals the ncessary detailed attention in the time available at the meeting. It was therefore agreed that members would review the proposals after DGP/19 and communicate any required changes to the Secretary. It was noted that this needed to be done by the end of November 2003 to allow timely production of the DGP/19 meeting report.

2.1.11 **Flammable Solids and Organic Peroxides with Explosive Subsidiary Risk**

2.1.11.1 It was recalled that at WG03, the attention of the Working Group had been drawn to an issue concerning flammable solids and organic peroxides with explosive subsidiary risk. It was advised that by aligning with the UN the Technical Instructions had inadvertently provided for the transport of such dangerous goods by air under exemption when previously they had been forbidden under any circumstances. It was questioned whether it had been the intention of the Panel to do this and the Working Group agreed that further research should be conducted into why the original prohibition was necessary.

2.1.11.2 Subsequent research had not produced the answer to this question. However, it was suggested that in the event of introducing an alleviation to the requirements of the Technical Instructions, more emphasis should be placed on establishing sound reasoning for introducing that alleviation and not why the original prohibition was in place. Expert opinion in one State was that the current wording of 1;2.1 would preclude the carriage of such dangerous goods, i.e. it was believed that a flammable solid or organic peroxide with an explosive subsidiary risk could be liable to explode, dangerously react, etc., under normal conditions of transport. Consequently, it was suggested that Tables 2-6 (list of currently assigned self-reactive substances) and 2-7 (List of currently assigned organic peroxides) are misleading in that they suggest that such dangerous goods may be carried with the addition of an “explosive” subsidiary risk label.

2.1.11.3 Finally, an anomaly had been noted in Notes 2, 3 and 4 of Table 2-6, which relate to a part S-2; 4.3.2.1 b), c) and d) of the Supplement; this part does not exist in the Supplement and it was not clear to what this should refer.

2.1.11.4 The proposed amendments to the Technical Instructions to rectify this situation were agreed.

2.2 REPORTS OF WORKING GROUP MEETINGS

2.2.1 Report of the Working Group of the Whole Panel Meeting (Frankfurt, 16-20 September 2002) (DGP/19-WP/11)

The meeting reviewed the report of this meeting (WG/02) which was accepted with an editorial amendment.

2.2.2 Report of the Working Group of the Whole Panel Meeting (Montreal, 5-9 May 2003) (DGP/19-WP/12)

2.2.2.1 The meeting also reviewed the report of this meeting (WG/03). An amendment to paragraph 10.3.1 was agreed to make it clear that the limit of 100 kg for the mass of aircraft batteries already existed and only a clarification of the "gross mass" expression was in question. With this change, the report was accepted.

2.2.2.2 The meeting reviewed a list of unresolved items carried over from WG/03. It noted that many of these had already been resolved, or were the subject of working papers at this DGP/19 meeting. A few items would need to be carried forward to the panel's future work. The meeting agreed that the method of presenting the items gave a clear picture of what is required to be done and who would be responsible for doing it. It agreed that the presentation should be used for future meetings.

2.2.3 Report of UN meeting on Limited quantities (WG/19-IP/9)

2.2.3.1 The meeting heard a report from the Chairman of the UNSCETDG on a meeting recently held to discuss limited quantities. Several transport modes had provisions for limited quantities of dangerous goods, including ICAO, whose provisions were generally the most restrictive. The UN Sub-Committee was now endeavouring to develop revised multi-modal provisions to which it was hoped all modes could subscribe. The recent meeting had been the second one on the topic and it was hoped that the UN Sub-Committee could finalise its recommendations at the end of 2004. Some progress had so far been made in revising the current provisions of Chapter 3.4 of the UN Recommendations but more work was still to be done.

2.2.3.2 It was agreed that ICAO and the DGP should take a constructive role in this process to ensure that the air mode's position was clearly stated. Time did not allow the DGP/19 meeting to study the report in depth. It was however evident that there were significant differences between the views of the air mode and the surface modes on this subject. Some other modes went so far as to question the need for limited quantity provisions whereas they were of great importance in the air mode. Moreover, there were also differences between the views of DGP members on the subject. It was agreed that there was a need for a review of the Technical Instructions provisions concerning limited quantities, but it was difficult to see how this could be done in time to present a unified air mode position to the UNSCETDG before its meeting in December 2004, at which time it would probably finalize its recommendations.

2.2.3.3 It was therefore agreed that DGP members should study the report after DGP/19 and discuss it with other members as far as possible. They would also, whenever possible, make sure that their national UNSCETDG members were made aware of the air mode's views on the matter. Members should also

communicate their views to the Secretary in time for an air mode position to be put before the UNSCETDG meeting in July 2004.

2.3 INFECTIOUS SUBSTANCES (DGP/19-WP/32 REV.; DGP/19-WP/55 AND ADD. 1; IP/7; IP/11; IP/12)

2.3.1 The meeting noted that this subject had been discussed at the working group meetings and that there were differing views which needed to be resolved. A number of aspects of the subject had also arisen in the general discussion on changes to the Technical Instructions to align with the UN Recommendations (see 2.1 of this report) and these had been carried forward to this discussion.

2.3.2 The DGP's review of this subject arose from the UNSCETDG's decision to change the method of classifying infectious substances (Division 6.2) from one which used four risk groups to one which used two categories (A&B). The scientific background for the decision to make the change (which came from the World Health Organization (WHO)) was explained to the meeting. In particular, it was pointed out that the previously used risk groups had been based on the level of danger to laboratory workers, whereas the new categories were based specifically on the risks encountered in transport.

2.3.3 The system now appearing in the UN recommendations divided Division 6.2, Infectious Substances, into Categories A and B. Category A substances were defined as those which are transported in a form that, if exposure occurred, were capable of causing permanent disability, life threatening or fatal disease to humans or animals. Such substances could only be carried under the conditions specified in PI 620. PI 620 would replace the existing Packing Instruction 602 in the Technical Instructions, to which it was very similar. It would apply to UN 2814 (infectious substances affecting humans) and UN 2900 (infectious substances affecting animals only). Substances which do not meet the criteria for inclusion in Category A would be in Category B and could be carried under the provisions of PI 650. Such substances would be collectively under UN 3373 with the proper shipping name of "Diagnostic Specimens" or "Clinical Specimens". The transport conditions of Packing Instruction 620 were necessarily more stringent than those of PI 650.

2.3.4 In developing this new scheme, the WHO had taken account of the real risks involved in the transport environment (as opposed to the perceived risks). Account had been taken of factors such as the likely damage to packages (taking into account the fact that triple packagings were required); the quantity of pathogens likely to be released (which would be very few or none if adequate absorbent material was used in the packages); the likelihood of the pathogens coming into contact with a susceptible host; the means of entry into the host (e.g. by skin absorption, inhalation, gastrointestinal tract — the unlikely formation of aerosols or droplets in a transport environment was stressed); the infection dose required (which could be high); and the susceptibility of the host (i.e. sufficient pathogens to overcome the immune system).

2.3.5 The importance of transporting diagnostic specimens by air was stressed. The ability to send specimens for analysis to expert facilities was a vital link in the public health system, and any way of safely simplifying the transport system should be welcomed. It was noted that very large numbers of such specimens were already shipped and the safety record had been excellent. Incidents had occurred, but resulting infections had been very few, if any.

2.3.6 The meeting reviewed the new Packing Instruction 650 developed by the UNSCETDG in detail, taking account of written views expressed by two members (in DGP/19-WP/32 Rev. and DGP/10-WP/55 and Add. and also comments carried forward from the general discussion of changes to the Technical Instructions arising from UN Recommendations (see 2.1 of this report).

2.3.7 There was initial discussion on whether any changes to the UN text agreed by the meeting should be incorporated into the next edition of the Technical Instructions or whether it should be referred to the UNSCETDG for further review first. Taking into account the fact that if the latter course were followed, it would be several years before the Technical Instructions would incorporate the new PI 650, the large majority agreed that the version of Packing Instruction 650 as modified by this meeting should go into the next edition of the Technical Instructions unless the meeting decided otherwise in any particular case. It was appreciated that this would introduce inter-modal differences, but it was always understood that each mode could diverge from the UN Recommendations if it had mode-specific safety concerns. It was agreed to inform the UN Sub-Committee and the other modes of any diversions from the UN Recommendations decided upon. It was noted that IMO had already incorporated the new Packing Instruction 650 and that the European land modes had agreed to do so. One member formally requested that his opposition to this diversion from the UN Recommendations be recorded.

2.3.8 Discussions and decisions on the individual paragraphs of Packing Instruction 650 were as follows:

Paragraph 1 – No change.

Paragraph 2 – It was proposed that the outer packaging should be rigid since non-rigid packaging would not afford the same level of protection from crushing or puncture of the inner receptacle as a rigid packaging. It was noted that rigid outer packaging was already in common use and that the majority of incidents that had occurred had been with non-rigid packaging. A further suggestion was that, as an option, the intermediate packaging could be rigid. On further discussion it was agreed that it would not be practicable to have a rigid secondary packaging with a non-rigid outer packaging. A member also pointed out that this packaging was a specific form of combination packaging and all other such packagings in the Technical Instructions required rigid outer packagings. It was therefore agreed to require a rigid outer packaging.

Paragraph 3 – It was suggested that the requirement for puncture resistance inevitably raised the question of an appropriate test for this characteristic and no information was provided in this respect. It was pointed out however that the same requirement already exists in the current version of Packing Instruction 650 in the Technical Instructions and had not caused a problem. It was therefore agreed to make no change to the UN test.

Paragraph 4 – Amendments to the UN text concerning marking and labelling were proposed to:

a) specify the shape and size of the diamond marking as well as the size of the characters inside the marking; and

b) require the proper shipping name (Diagnostic Specimen or Clinical Specimen) with a specified size to be marked on the package adjacent to the diamond mark.

These proposals were generally accepted but there was some opposition to marking the proper shipping name, mainly for language reasons. The majority of members was in favour of the proposed changes, including adding the proper shipping name.

Paragraph 5 – It was agreed that there be a minimum surface dimension of one side of the package of 100 mm x 100 mm should be specified, but that this requirement should be made into a separate sub-paragraph.

Paragraph 6 – A proposal to add quantity limitations was made. It was suggested that the UN Sub-Committee should be advised of these limits, which were consistent with more severe limitations on packages for air transport, but that no request need be made for other modes to make a similar change. Some members questioned whether quantity limitations were necessary, providing adequate absorbent material was provided. It was suggested that the problem was more one of perceived risk when large quantities were involved. On the other hand, these substances were normally in small quantities and the raising of the inner receptacle limit to one litre was expected to cater for all cases. The proposed limits of one litre for inner receptacles and four litres for outer packagings were agreed.

Paragraph 7

a) A similar outer packaging quantity limit for solid materials was proposed. It was noted that no limit for inner packagings was suggested since solid substances were much less likely to escape from the packagings. The proposed limits of 4 kg for an outer packaging was agreed and additional text was developed to make it clear that the lack of an inner packagaing limit was intentional.

b) It was proposed that, with these changes to Packing Instruction 650, SP A81 was no longer needed and could be deleted. However it was pointed out that the second sentence concerning body parts, etc., was still relevant for UN 2900 and UN 2814 and the meeting agreed to retain it. It was also pointed out that existing Packing Instruction 602 (now Packing Instruction 620) referred to special packaging for organs and large body parts, but there were no details concerning such packaging available. It was agreed to draw the UNSCETDG's attention to this matter.

c) The possibility of packages containing larger quantities also needed to be recognized and it was agreed to add text allowing larger quantities under competent authority approval.

Paragraph 8 – A proposal was made to add a requirement that the net mass of any solid carbon dioxide in the packaging should be marked on the package. In response it was pointed out that the paragraph already stated that if solid carbon dioxide or liquid nitrogen were used, the applicable regulations of the Technical Instructions regarding these substances would have to be met - and these included indicating the net mass of carbon dioxide on the

packaging. The proposal was withdrawn. It was subsequently suggested that the whole of the final sentence concerning the design and construction of packagings to prevent a dangerous build up of carbon dioxide gas fell into the same category and should also be deleted. Some members supported this view, but others were of the opinion that the reminder concerning the release of carbon dioxide gas was very valuable. The meeting subsequently agreed to retain the text relating to avoidance of gas pressure build-up, but deleted the further text relating to marking.

Paragraph 9

a) Amendments to paragraph 9 were suggested which would require:

i) identification of infectious substances, including the technical name, on the transport document;

ii) marking of the proper shipping name "Diagnostic Specimens Containing Infectious Substances," on the packages;

iii) labelling with the infectious substances hazard label; and

iv) specifying additional handling requirements for the operator, including acceptance procedures, storage and loading, inspection for decontamination, and provision of information, except for advance arrangements.

Concerning i), it was recalled that it had been decided at WG/03 that Category B substances should not be included on the transport document (but an alternate document, such as the airway bill could be used). Concerning item ii), it had already been agreed to require the proper shipping name on the package. The majority of members disagreed with the first three proposals. Since the member proposing these changes indicated that he considered them as a unit, it was agreed not to pursue them further.

b) Further consideration of Paragraph 9 led to a lengthy discussion concerning the fundamental nature of the new approach to Division 6.2 substances and it was acknowledged that some confusion or uncertainty existed in the minds of members and observers. It was noted that if these doubts persisted among the experts of the DGP, there would be an even greater danger of misunderstanding in the field. A major problem appeared to be that substances which would now fall into Category B had the proper shipping name "Diagnostic Specimens"; however, many substances which might reasonably be called diagnostic specimens in the normal usage of these words would not in fact be dangerous goods of Division 6.2 and not subject to the provisions of the Technical Instructions. An example of such substances would be blood samples for the purpose of cholesterol tests which could be considered as diagnostic specimens but did not meet the criteria for dangerous goods;

c) It was suggested that a simple way of overcoming this problem area might be to require all materials of animal or human origin (which did not meet the criteria for Category A) to be transported as Category B substances. However, this would result in substances which were not, in fact, dangerous goods having to be packaged and transported as dangerous goods and this could pose legal problems;

d) It was noted that the new classification provisions to be included in Part 2; 6.3.2.5 listed several substances which would not be included in Category B, which was helpful, but that most of such substances should not have been considered as dangerous goods in the first place;

e) To assist in this matter, the meeting agreed to seek clarification from the UNSCETDG, especially regarding the exceptions of paragraph 2; 6.3.2.5;

f) A further proposal was made to add to Paragraph 9 a list of those parts of the Technical Instructions which had to be complied with in addition to the provisions of PI 650:

i) The first proposal was for the requirement to have an airway bill or similar document giving the proper shipping name, UN number, the name, address and telephone number of the shipper and the number of packages. It was generally agreed that the main requirement was to be able to obtain information on the contents of the package if it were needed and even the shipper might not be able to supply this. A telephone number of an appropriate person might suffice (in most parts of the world). Differing views were expressed on whether the information should be on a separate document, or should appear on the package itself – there being advantages and disadvantages for both cases. A further suggestion was that the information could be given on a separate document and on a label attached to the package. It was pointed out that allowing these packages in the mail meant that attaching a label to the package would not be useful since no one but postal authorities were allowed to open mail bags, even in an emergency. It was further pointed out that if a mail bag could not be opened, even a separate document would be of little value. Moreover, the nature of these packages was such that it was very unlikely that a leak would be discovered until the package was unloaded from the aircraft. Informal discussion with the Universal Postal Union (UPU) indicated that that body was awaiting ICAO action on this matter and that it would be opposed to an additional document for these packages; the placing of infectious substances in dedicated mailbags was, however, a possibility that could be pursued. After considerable discussion it was agreed to require that information either on a document such as an air waybill or a label on the package, on the understanding that the subject would be taken up again after consultation with UPU.

ii) The second proposal was to require classification in accordance with Part 2; 6.3.2. The proposer noted that this exception would not be required if a further proposal relating to Paragraph 10 were to be agreed (see **Paragraph 10** below). Some

members felt that this was already implied if inclusion in Category B was being considered, but the majority of members agreed to include the text; and

iii) The meeting agreed to add a further exception to require the incident reporting requirements of 7; 4.4;

iv) The meeting agreed to add a new sub-paragraph iv) to Paragraph 9 f) indicating that passengers were not permitted to carry these substance on board on their persons or in their hand baggage. It was also proposed to repeat this prohibition in Part 8, since this Part was stand-alone information for passengers. There was opposition to this proposal since it was considered to be inconsistent to refer to what could not be carried on board in a Part otherwise dedicated to goods which passengers could take on board. The meeting agreed by a small majority to add a note to Part 8.

g) Attention was drawn to the new text of the UN Recommendation appearing as 7; 3.1.5 in the Technical Instructions (DGP/19-WP/8) and it was proposed that this was also an exception to be added to Paragraph 9. It was pointed out that this posed many difficulties for operators because they would not necessarily know where Category B packages were stowed and also because of the high number of such packages normally carried. In any case, the requirement to inspect after a leaking package was found was already contained in 7; 3.1.3. It was therefore agreed not to include 7; 3.1.5 and to advise the UNSCETDG that it was already covered by existing requirements in the air mode;

h) A proposal was discussed to add a further exception in 2; 6.3.2.5 covering dry blood spots. These are blood specimens drawn from healthy patients (typically infants) for routine test and screening purposes. The blood is allowed to saturate paper and then dry completely. The specimens pose an extremely minimal risk of infection. Millions of such specimens are transported and it was considered that they need not meet the requirements of Division 6.2. It was agreed that the UNSCETDG should be approached to include these specimens in the list of exceptions.

i) 1) A member suggested that a further provision should be added to Paragraph 9 concerning the need to provide information to the pilot-in-command concerning Category B substances on board. He believed that if pilots were not informed there would be confusion leading to an increased incidence of shipments being unloaded, the filing of airline variations and ultimately to an increase in undeclared shipments. Moreover, the captain needed to know what was on board to be able to discharge all his responsibilities in relation to the safety of passengers, crew members and loaders while in or at the aircraft. This was especially needed now that, under the new system, a number of substances which had previously travelled under the provisions of PI 602 (now PI 620) would be in Category B, travelling under relaxed requirements. He also indicated that leaking of Category B substances would necessitate protective measures and clean-up procedures as indicated by the WHO. Leakage on board an aircraft in an accessible compartment would mean the use of the new Drill Code 11 using information on the NOTOC. Concerning the

comparison with excepted dangerous goods, (for which no NOTOC is required) it was pointed out that the quantities were very different – 30 ml maximum for excepted quantities compared with one litre for Category B infectious substances, which was much closer to the limited quantity amounts;

2) Other members believed this was not necessary. It was unlikely that the captain would know if a problem occurred in flight with a Category B package and there were already precedents for substances not being included in the NOTOC (e.g. excepted quantities). Moreover, the reason for some substances moving from PI 602 to Category B was a reassessment of the risks in transport conditions. The importance to human health of the unimpeded flow of diagnostic specimens through the transport system was stressed. Very large numbers of such specimens were already being transported and any complication of the process would be costly and undesirable. It might lead to airlines refusing to accept such packages which would probably lead to their not being declared. The medical opinion had been that the quantity of the material in packagings did not significantly increase the risk of infection, given the absorbing material in the packaging. It had been agreed that a transport document was not required and without that it would be very difficult to prepare a NOTOC. Equally, a NOTOC could not be prepared for packages travelling by airmail;

3) After a thorough discussion of the issue, members were evenly divided on whether a NOTOC should be required. In this situation no requirement could be endorsed by the meeting;

Paragraph 10 – The proposal was made to add text to this paragraph stating that the person who prepares and offers the package for transport must be able to determine whether it would be Category A or B. While some members considered this to be desirable, others doubted its feasibility. The proposal was not agreed.

Paragraph 11 – It was agreed to add a new Paragraph 11 concerning the visibility of the Category B markings on packages in an overpack.

Paragraph 12 – It was mentioned that packages of infectious substances sometimes contained small quantities of other dangerous goods, usually in Classes 3, 8 or 9, used to stabilize or prevent the degradation of the specimen. It was therefore proposed to add a new Paragraph 12 allowing these other classes to be included, without any other requirements, when they were present for the stated purposes and provided the quantity in each inner packaging did not exceed 30 ml. This figure was chosen as being the existing limit for excepted quantities. It was suggested that a maximum quantity of 50 ml could be allowed, but it was not apparent that this was necessary and in any case would introduce difficulties of consistency with the excepted quantity provisions. The meeting agreed in principle with the proposal but with a revised and clarified text. It was noted that a similar provision should be added to PI 620 for Category A substances.

Paragraph 13 – It was agreed that text for a new Paragraph 13 should be developed prohibiting passengers from taking Category B substances onto an aircraft on their persons or in their cabin baggage. It was also suggested that a similar reference should be included in 8; 1.1.1. However, it was noted that it would not be appropriate to include a reference in Part 8 to materials which were not allowed in a Part which was dedicated to substances which were allowed. Since the subject was now clearly covered in the new Paragraph 11 of Packing Instructions 650, the meeting agreed not to amend Part 8.

2.3.9 It was noted that the Technical Instructions currently address the question of using live animals to transport infectious substances in 5; 4.2. A new text had been recommended by the UNSCETDG, but it was considered that a modified version of the existing Technical Instructions text was preferable and should be retained. This was agreed.

2.3.10 A member wished to state that, as recorded in the report on this topic, he had strong reservations about the new classification method for infectious substances and the consequent amendments to the Technical Instructions. He concluded that when the international pilot community became aware of the changes it was uncertain whether this might lead to an increased possibility of flight crews refusing to accept packages containing Category B substances.

2.3.11 **Dangerous goods in airmail**

Part 1; 2.3.2 a) was reviewed in light of the changes in the classification of infectious substances. This provision allows infectious substances to travel in airmail and it was suggested it should now be limited to Category B infectious substances. Some members considered that Category A substances, which were fully regulated, should continue to be allowed in airmail. It was stated that this was necessary for health reasons; it could be dealt with nationally by States for internal mail, but needed to be covered by the Technical Instructions for international mail. The meeting agreed not to change the text but to draw the matter to the attention of UPU.

2.3.12 **Revision to classification criteria for Class 6**

2.3.12.1 The meeting reviewed the revisions to Part 2, Chapter 6 covering the revised classification criteria for Division 6.2. It was suggested that the definition of diagnostic specimens at present contained in SP A141 should also be included, for clarification, in paragraph 2; 6.3.2. However, it was pointed out that the UNSCETDG had specifically removed this text and it should not be reinstated.

2.3.12.2 It was further considered that the continued use of the term “diagnostic specimen” was at the root of much of the confusion which continued to surround this issue. The problem was that, in common usage, diagnostic specimens could be substances in Category A, Category B or not dangerous goods of Division 6.2 at all, whereas “diagnostic specimen” was the proper shipping name (PSN) for substances in Category B. It was suggested that the proper solution to this dilemma would be to change the PSN for Category B substances to something other than “diagnostic specimens”.

2.3.12.3 There was general agreement with this point of view, and it was agreed that it should be communicated to the UNSCETDG. It was, however, noted that it was unlikely that any change to the UN Recommendations could be made during the present amendment cycle of that document.

2.3.12.4 A clarifying amendment to 2; 6.3.2.5 was made and it was agreed that this would also be communicated to the UNSCETDG.

2.3.12.5 It was agreed that further clarification of the definition of cultures in 2; 6.3.1.3 was needed and that the UNSCETDG should also be approached on this matter.

2.3.12.6 It was noted that 6.3.4.1 indicates that genetically modified microorganisms which are not infectious substances should be classified according to Chapter 9 of Part 2. However, 6.3.2.4 contains a definition of these organisms which is consequently out of place in Chapter 6. It was therefore agreed to delete 6.3.1.4 and advise the UNSCETDG accordingly.

2.3.13 **Special provision A 141**

It was agreed to delete the last sentence of this special provision since the exceptions are already stated in Packing Instruction 650.

2.3.14 **Special provision A 81**

An earlier proposal to delete SP A 8l was recalled. It was pointed out that this provision allowed the possibility of transporting body parts containing infectious substances, which otherwise exceeded the mass limits, on passenger aircraft, which were sometimes the only means of transport available. It was noted that it was agreed that this situation could be covered under the approval process and that it had also been agreed to refer the matter to the UNSCETDG.

2.3.15 **Special responsibilities in accepting infectious substances**

2.3.15.1 The meeting reviewed 7; 1.2 concerning the operator's acceptance of infectious substances in light of the new classification criteria. Part 7; 1.2.1.1 requires advance arrangements for the shipment of infectious substances to be made between the shipper and the operator. It was suggested that this requirement could not be fulfilled because the shipper did not necessarily know who the operator would be. It might also be undesirable for security reasons. Furthermore, it could not be done for infectious substances sent in the mail.

2.3.15.2 It was agreed that, in any case, Part 7 was not an appropriate location for this provision. However, it was also noted that it had already been deleted from Part 5 and if it were removed from Part 7 it would disappear from the Technical Instructions altogether. It was agreed that the principle in the text should be retained, but there needed to be clarification of its purpose.

2.3.15.3 Concerning 7; 1.2.1.2, it was suggested that it was not acceptable to force an operator to accept infectious substances packages. It was further suggested that the intent of the paragraph concerning expediting the transport was already covered by 7; 1.2.3. The remainder of the paragraph appeared to deal

with routine procedures when a non-conforming package is offered for transport. It was therefore agreed that 1.2.1.2 could be deleted and that the UNSCETDG should be informed.

2.3.16 **Stowage of infections substances**

Paragraph 7; 2.8 of the Technical Instructions was reviewed in light of the new classification system for infectious substances. It was agreed that it should now only refer to Category A infectious substances.

2.3.17 **Empty packagings**

It was agreed that the text of this paragraph should not be changed, apart from an editorial correction.

2.4 TECHNICAL INSTRUCTIONS, PART 1 - GENERAL

2.4.1 Medical aid in flight (DGP/19-WP/15, DGP/19-IP/4)

2.4.1.1 A member recalled that at a Working Group meeting the problem of transporting dangerous goods required to provide medical aid to a patient in flight on a flight before or after collection of the patient had been discussed. It had been proposed to extend the alleviation of Part 1: 1.1.3 a), to flights before and after the flight on which medical aid was provided. Although there was general agreement with the intent of the proposal, some members thought that the proposed solution was too far reaching and could include aircraft other than those operating in a dedicated air ambulance configuration. The proposal had been redrafted taking account of these comments and was presented to the meeting for further review.

2.4.1.2 Some members believed that air ambulance aircraft were covered under the provisions of 1;2.2.1 (“articles and substances which would otherwise be classified as dangerous goods...that are authorized by the State of the Operator to meet special requirements.”); others felt that the proposed text required further modifications to restrict the intent. The proposed amendment was withdrawn.

2.4.2 Application of training programmes (DGP/19-WP/44 and DGP/19-WP/50)

2.4.2.1 It was recalled that, at the last working group meeting, an ad hoc Working Group had been formed to facilitate discussion on various proposals to modify Table 1-4. Based upon the outcome of the ad hoc Working Group’s discussion a further proposal for the modification of Part 1; 4 and Table 1-4 in relation to dangerous goods training programmes was now being made.

2.4.2.2 At the ad hoc Working Group, concern had been raised with regard to the inclusion of additional categories of staff, who have no responsibility for handling dangerous goods, and the jurisdiction of the Technical Instructions in this area was questioned. It was noted that the Technical Instructions in 1; 4.1.1 requires that dangerous goods training programmes be established and maintained by or on behalf of persons with various responsibilities in processing cargo (not necessarily involving dangerous goods). Of those persons, two groups, c) and f) are identified as "processing cargo". In addition the Panel, at DGP/18 had

determined, with the addition of Category 9 - Cargo acceptance staff (other than dangerous goods acceptance staff), that persons handling only non-dangerous goods must also undertake dangerous goods training. On that basis it was believed that it had already been established that the Technical Instructions have the jurisdiction to require dangerous goods training for persons handling non-dangerous goods where the training will act to reduce the likelihood of undeclared or 'hidden' dangerous goods getting onto an aircraft. Table 1-4 had also been revised to put all freight forwarder personnel together, followed by operator/ground handling agent personnel, including security screeners, which was considered to be a more logical and useful arrangement. The revised Table 1-4 was presented for the meeting's review.

2.4.2.3 The meeting was advised that, in the preliminary view of the ICAO Legal Bureau, the Technical Instructions could address any persons who might be involved in the transport of dangerous goods, and that could be interpreted as including cargo acceptance staff who did not normally accept dangerous goods but who should nevertheless be on the lookout for dangerous goods travelling as normal cargo.

2.4.2.4 The meeting reviewed the proposed new Table 1-4 and made some amendments to it to improve its clarity. In particular, a new column relating to the training requirements for security screeners was added and the training requirements relating to general packing requirements and packing instructions were combined.

2.4.3 **Recurrent training**

2.4.3.1 It was pointed out that Part 1; 4.2.2 of the Technical Instructions requires recurrent training to be undertaken every 24 months. This provision is often interpreted by industry as meaning that if an individual for some reason exceeds this period, he or she has to undergo initial training to re-certify. However, it is suggested that as written, this is not necessarily so; if an individual has been in day to day contact with dangerous goods it may be quite appropriate for him or her to undergo recurrent training if it had been more than 24 months since their previous training. It was suggested that a note in 1; 4.2.2 could clarify this.

2.4.3.2 Several members had difficulty with the proposed text which it was felt was too open to interpretation. It was the general opinion that the provisions left it to States to decide the extent of the recurrent training required and that in the circumstances described it was certainly not intended that full initial training be undertaken. No change to the Technical Instructions was made.

2.4.4 **Training for cabin crew**

2.4.4.1 A member noted a inconsistency between the Technical Instructions and Annex 6 in respect of recurrent training for cabin crew. 1;4.2.2 of the Technical Instructions requires recurrent training every 24 months, however, 12.4 e) of Annex 6, Part 1 requires recurrent training annually. It was further noted that Annex 6 does not contain specific provisions relating to dangerous goods recurrent training for flight crew members. It was suggested that this could be because of the licensing requirements for flight crew members to which cabin crew members were not subject.

2.4.4.2 Rectification of this discrepancy could be achieved in a number of ways. Annex 6, 12.4 e) could be amended to align with the Technical Instructions, which was the meeting's preferred solution,

alternatively the Technical Instructions could be aligned with Annex 6 or to remove the cabin crew requirement could be removed from Annex 6.

2.4.4.3 It was agreed that the Secretary should bring this anomaly to the attention of the appropriate section of the ICAO Secretariat and obtain their views on the optimum solution.

2.5 RADIOACTIVE MATERIALS

2.5.1 Transport Index Limitation of Compartments (DGP/19-WP/19)

2.5.1.1 A member pointed out that Part 7;4.2 of the Technical Instructions requires an operator to specify, in a suitable manual, the maximum total sum of transport indexes of radioactive material permitted in each compartment. The maximum Transport Index of a package of radioactive material permissible in a cargo compartment is dependant on the distance between the surface of the package and the nearest inside surface of the passenger cabin or flight deck partitions or floors, in accordance with Table 7-5. Consequently, it is impossible to specify a maximum sum of Transport Indexes of a compartment if the size of the package(s) of radioactive material is not known. Part 7;4.2 therefore imposed a responsibility with which an operator could not comply. The manuals of various operators had been studied and it was noted that these provided guidance to staff about loading radioactive material, rather than specifying the information currently required by 7;4.2 and it was therefore suggested it would be more realistic for the Technical Instructions to require information of this nature.

2.5.1.2 While acknowledging the problem, some members believed that it was desirable that operators should still specify a maximum total Transport Index for each hold. One member suggested this could be based on a worst case scenario; another suggested using a typical package size. The member presenting the paper agreed to re-draft the proposed amendment taking account of the comments made. The proposal was modified to take into account the imposed limits contained in 7; 2.9 and was agreed.

2.5.2 Handling Label - Excepted Packages of Radioactive Material (DGP/19-WP/58)

2.5.2.1 A member reminded the meeting that there had been a general consensus from the working group that a handling label for excepted packages of radioactive material (similar to the one adopted by IATA for excepted quantities of dangerous goods) could facilitate the acceptance, carriage, and the reporting of incidents involving excepted packages of radioactive material. A revised proposal for amendment of the Technical Instructions, based upon the comments made at the working group, was presented for the meeting's review.

2.5.2.2 While not being against the proposal, some members believed it had intermodal implications and should be reviewed by the UNSCETDG before being adopted in the Technical Instructions. Other members felt that there was an urgent problem which this label could alleviate, and that it should be introduced for the air mode without waiting for UNSCETDG review. Some members also believed that the proposed label format could be considerably simplified.

2.5.2.3 A simplified version of the label was prepared and reviewed by the meeting. Minimum dimensions of 100 mm x 70 mm were suggested. Members were again urged not to take a decision on this label for the time being but instead to take their concerns about acceptance difficulties with excepted radioactive material to the IAEA meeting on the subject to be held in January 2004. This would ensure a multi-modal approach to the problem through IAEA and eventually UNSCETDG. If ICAO were to take unilateral action now it would run the real risk of having to amend the label in two years if IAEA/UNSCETDG decided upon a different label (or no label). Specific difficulties were foreseen over the size of the label, since some excepted packages of radioactive material were very small and it would not be sensible if the label were to dictate the size of the package.

2.5.2.4 It was pointed out, however, that the proposal for the label had already been made to IAEA who had recommended that it first be examined by ICAO - which was the main reason for presenting it at this meeting. In response it was suggested that IAEA had only requested ICAO's views on the label and was not expecting implementation of the label by the air mode before an intermodal review.

2.5.2.5 It was reiterated that the objective of the label was to expedite the flow of these packages, which were often sent for urgent medical reasons, through the transport system. Some members mentioned that they had difficulties in their States with such packages, while others had not experienced such problems.

2.5.2.6 After a thorough discussion of the issues, the meeting decided by a clear majority to accept the label in principle. The possibility of allowing a transition period for the introduction of the label was suggested; it was agreed 1 January 2007 would be an acceptable date for commencing mandatory use.

2.5.2.7 In order to reduce potential problems related to the package size, it was agreed no label size would be prescribed but that text would be developed to ensure the legibility of the label. It was further agreed that both the text and hatch markings would be either red or black on a contrasting background. With regard to the proposed wording "The information for this package need not appear on the Notification to Captain (NOTOC)", a number of members believed it was inappropriate to include this text on the label and it was decided a note would be developed to refer to the optional inclusion of such text.

2.6 DANGEROUS GOODS LIST AND PACKING INSTRUCTIONS – PART 3

2.6.1 Receptacles, Small, Containing Gas and Gas cartridges (DGP/19-WP/56)

2.6.1.1 A member pointed out an inconsistency in the Technical Instructions concerning UN 2037 (**Receptacles, small, containing gas** and **Gas cartridges**). The Technical Instructions permit **Receptacles, small, containing gas** in limited quantity packagings (Y203). The Technical Instructions (3; 4.1.2) allow Division 2.1 gases to be packed in limited quantity packaging only where they meet the criteria for an aerosol. Part of the definition of aerosol states "fitted with a release device...". However, the entry in Table 3-1 for **Receptacles, small, containing gas** has text in light type that states 'without a release device'. Therefore **Receptacles, small, containing gas** are not aerosols and do not meet the provisions applicable to limited quantities. Furthermore, although **Gas cartridges** and **Receptacles, small, containing**

gas share the same UN 2037, limited quantities are permitted for **Receptacles, small, containing gas** but they are not permitted for **Gas cartridges**. It was therefore proposed to remove the small quantity concession for **Receptacles, small, contains gas**.

2.6.1.2 During the discussion, an alternative approach was suggested whereby the limited quantity packing instruction would be extended to cover **Gas cartridges**. It was noted that in the UN Recommendations, the small quantity concession was applied to both entries by means of special provision SP277. However, other members suggested that further investigation of the properties of **Gas cartridges** was warranted before making a decision.

2.6.1.3 A proposal to modify 3; 4.1.2 by adding UN 2037 was agreed, following a modification to exclude any articles with a subsidiary risk. A proposal to amend the entries for **Gas cartridges** in Table 3-1 was agreed with a consequential amendment to the **Receptacles, small containing gas** (oxidizing) entry.

2.6.2 Protective Breathing Equipment (PBE) Smokehoods containing chemical oxygen generators (DGP/19-WP/18)

2.6.2.1 It was recalled that, following the Valujet accident in 1996, provisions had been developed for the carriage by air of chemical oxygen generators. Although that accident involved the chemical oxygen generators which are fitted in Passenger Service Units (PSUs) (the equipment located above passengers which also contains air vents, no-smoking/ seat belt signs, etc.), the new provisions applied to all generators and so included protective breathing equipment (PBE) smoke hoods which rely on chemically produced oxygen, typically used by cabin crew/ members. It was pointed out that the generators used in PBEs are very different to those involved in the Valujet accident. They are much smaller and produce less oxygen, since they need only supply one person (the crew member) as opposed to three or four persons supplied by a PSU. Most significantly, when contained in a smoke hood, the temperature attained is considerably lower, not least because the smoke hood will be worn by a single crew member. The present requirements were causing unnecessary operational difficulties for operators when a PBE had to be replaced at an outstation to which there was no cargo aircraft service. Several alternative proposals were therefore put forward for solving this problem.

2.6.2.2 It was pointed out that these units were part of the operational equipment needed to be carried on an aircraft; they had a very long operational life and should not need replacing at short notice unless they had been used in an emergency. It was also considered to be essential not to dilute the general requirements concerning oxygen generators.

2.6.2.3 The majority of members was in favour of an amendment to the Technical Instructions in this case, but revisions were required to the proposed text.

2.6.2.4 The proposals were modified in order to clarify the intent was to provide relief for those PBEs intended for use by air crew members to be transported as cargo on passenger aircraft; these were agreed. Additional amendments to the requirements for the information to the pilot-in-command to ensure that the pilot was informed of the special nature of these oxygen generators were agreed.

2.6.2.5 It was noted that chemical oxygen generators which were unserviceable should not be permitted for transport; an amendment to Special Provision A111 to reflect this prohibition was agreed.

2.6.3 Amendment to A112 for consumer commodities (DGP/19-WP/22)

A member noted that currently, certain dangerous goods may be transported as consumer commodities even though they are forbidden on passenger aircraft. Examples include: **Aerosols** flammable (engine starting fluid), UN 1950, **Chloropicrin, mixture, n.o.s.**, UN 1583, **1-Chloropropane**, UN 1278, **Elevated temperature liquid, flammable, n.o.s.**, UN 3256. It was therefore proposed that dangerous goods that are forbidden for transport on passenger aircraft should not be permitted for transport as consumer commodities. The meeting agreed to this proposal with some amendments to the proposed text.

2.6.4 Amendment to ID Number (DGP/19-WP/23)

2.6.4.1 It was pointed out that ID Numbers (ID 8000, etc.) are discussed in 3;2.1.1 when explaining Column 2 of the Dangerous Goods List (Table 3-1): "...a temporary identification number (ID) in the 8000 series has been allocated and is indicated where appropriate." However, nowhere else in the Technical Instructions is the "ID" prefix indicated or otherwise mentioned. 5;2.4.1.1 and 5;4.1.2.c) only direct the user to use the prefix "UN" before UN numbers when marking packages and completing the transport document. The list of UN numbers in Appendix 1 also does not mention the existence of an "ID" prefix. Although it was recognized that the goal of the Panel was to replace all the ID numbers with appropriate UN numbers, and the only ID number left was ID 8000, until this goal is attained it was suggested that the oversight should be corrected. An amendment to 3;2.1.1, Column 2 was consequently proposed.

2.6.4.2 The proposed amendment was agreed in principle. However, it was pointed out that there were several other references to ID numbers in the Technical Instructions and instead of changing all of them, it might be simpler to develop a new Special Provision. The Secretary agreed to investigate this possibility.

2.7 PACKAGING AND PACKING INSTRUCTIONS – PART 4

2.7.1 UN 1044 - Fire Extinguishers (DGP/19-WP/45)

2.7.1.1 A member noted that, prior to 2003, Packing Instruction 200 described the general provisions for packaging gases in cylinders. Included in Packing Instruction 200 by virtue of their classification in Division 2.2 were **Fire Extinguishers** with compressed or liquefied gas", UN 1044. When the changes from the UN 12th Edition were incorporated into the 2003-2004 edition of the Technical Instructions, Packing Instruction 200 was significantly amended. Part of the amendment included the adoption of tables listing the requirements applicable to cylinders containing compressed gases and liquefied and dissolved gases. There is no entry in either table for UN 1044. The reason for the omission of UN 1044 from either table is that the UN Model Regulations do not place UN 1044 in Packing Instruction P200, but in P003. Packing Instruction P003 is a general packing instruction that applies to a wide range of substances and articles such as UN 1845

- **Dry ice**, UN 1950 - **Aerosols**, UN 2037 - **Gas cartridges**, UN 2857 and UN 3358 - **Refrigerating machines**, etc. It was therefore proposed to introduce a new Packing Instruction 213 devoted solely to fire extinguishers.

2.7.1.2 A proposal to introduce a new Packing Instruction 213 devoted solely to fire extinguishers was agreed. It was noted a further modification to assign this packing instruction to Cartridges, power devices 1.4D may be made later.

2.7.2 Amendments to Packing Instruction 904 for Dry Ice (DGP/19-WP/24)

2.7.2.1 A member noted that Packing Instruction 904 for dry ice indicates that the dangerous goods transport document requirements of Part 5, Chapter 1, (Shipper Responsibilities) are not applicable provided alternative documentation containing the information required by 5; 4.1, excluding the packing instruction number and packing group, is supplied. Part 5, Chapter 1 only addresses documentation requirements in paragraph 1.1.c): "the dangerous goods transport document has been properly executed and the declaration signed."

2.7.2.2 Packing Instruction 904 grants the shipper an exception from indicating the packing instruction number and packing group and from signing and including a declaration on the alternative shipping document. However, it is also common industry practice to omit the following dangerous goods transport document elements that are also required by 5;4.1.:

a) the declaration statement (5;4.1.12)

b) the statement that the shipment is within the limitations prescribed for either passenger aircraft or cargo-only aircraft as appropriate (5;4.1.3.f))

c) the kind of package (5;4.1.5.1) - though the number of packages is usually shown.

Although this is standard practice, there have been enquiries suggesting that the current text is not entirely clear and that this exception should be more clearly indicated in the *Technical Instructions*.

2.7.2.3 It was also proposed to require that the net mass of the dry ice be marked on the outside of the package. This information was necessary to ensure that the dry ice is properly stowed in accordance with relevant loading procedures and to ensure that the concentration of CO2 does not exceed dangerous levels within the cargo hold.

2.7.2.4 The proposal was generally agreed but the meaning of the word “written” in the context of this provision was queried. It was explained that this was to ensure that a hard copy document was produced in light of the trend towards computerized documentation.

2.7.2.5 This lead to a discussion of the Introductory Note 2 to Chapter 4 of Part 5 which indicates that the use of electronic data processing and electronic data interchange, as an aid to paper documentation, is not precluded. It was pointed out that the electronic means were only as an aid to the paper document and

did not replace it. However, some members indicated that other provisions implied that the electronic means could replace the paper document. It was agreed to amend the note to indicate that it applied unless otherwise indicated.

2.7.3 **Package vs. Packaging (DGP/19-WP/52)**

2.7.3.1 The meeting's attention was drawn to Part 4 of the Technical Instructions and the requirements relating to different dangerous goods in one outer packaging; in particular to the exception in paragraph 1.1.8 concerning inner packagings of Division 6.2 (Infectious Substances). It was suggested that the intent of paragraph 1.1.8 was to require only appropriate materials to be included within an outer packaging of a package containing Division 6.2. Such appropriate materials may include the absorbent, refrigeration or freezing materials, inner packagings, and dangerous goods, such as the infectious substance or a preservative. However, the expression "inner packaging" in this context was misleading in view of the definition of packaging. An amendment to paragraph 1.1.8 to clarify the meaning was therefore proposed. It was also suggested that the words "unrelated types of goods" in 1.1.8 were ambiguous. While it was recognized that the types of goods may include infectious substances, materials for refrigeration or freezing, or other packaging materials, a different interpretation might allow Division 6.1 materials, or even Class 3 materials within the outer package. A further amendment to 1.1.8 was therefore proposed to clarify this point.

2.7.3.2 These proposals were agreed, with the deletion of the expression "diagnostic specimens" which was undesirable and redundant.

2.7.4 **Packing Instruction 900 (DGP/19-WP/14)**

2.7.4.1 A member drew attention to Packing Instruction 900 b), which for the transport of Vehicles, flammable gas powered, requires the pressure vessel(s) containing the flammable gas to be completely emptied and all lines from the vessel to the gas regulators, and the gas regulators themselves, also to be drained of all traces of flammable gas. To ensure that these conditions are met, gas shut-off valves must be left open and the lines to the gas regulators must be left disconnected upon delivery of the vehicle to the operator. He pointed out that, as a result of these requirements, the vehicles can lose a part of their national technical certification and licensing, and therefore may not be operated until they are re-certified by appropriate authorities and/or institutions. It was therefore proposed that an alternative to the present requirement of Packing Instruction 900 should be offered to shippers and a proposed wording put forward.

2.7.4.2 The view was expressed that a problem with national certification or licensing of road vehicles should not be an adequate reason for amendment the Technical Instructions. However it was explained that disconnecting lines and regulators was undesirable since it would allow the possibility of contamination in what was designed as a closed system.

2.7.4.3 Concern was expressed about the proposal to allow gas to remain in the fuel tank at a pressure up to 5 per cent of the maximum allowable working pressure of the system. Since system pressures varied considerably, 5 per cent could still result in a significant pressure. It was explained that this residual fuel pressure was necessary to allow the vehicle to move under its own power after unloading. Moreover, it was pointed out that this was a considerably more stringent requirement than that for vehicles powered by conventional liquid fuels, which were allowed on board aircraft with a quarter of a tank of fuel. In response,

it was pointed out that flammable gases were inherently more dangerous, because they were under pressure, than liquids.

2.7.4.4 The meeting agreed in principle with the proposal and, after a refinement of the text, it was agreed.

2.8 SHIPPERS RESPONSIBILITIES – PART 5

2.8.1 Keep Away From Heat Handling Label (DGP/19-WP/29)

2.8.1.1 It was pointed out that shippers of self-reactive substances of Division 4.1 and Division 5.2 organic peroxides are required, by Special Provision A20, and 5; 4.1.5.8.3, to include a mandatory statement on the dangerous goods transport document requiring that packages containing these substances must be "protected from direct sunlight, stored away from all sources of heat in a well-ventilated area." However, the persons who handle packages containing these substances, in the warehouse, and on the ramp during loading and unloading of the aircraft, and who would be able to ensure that packages containing these substances are protected from direct sunlight, do not have access to the dangerous goods transport document and the mandatory statement.

2.8.1.2 These ramp and warehouse personnel generally depend on the presence of hazard and handling labels to ensure that dangerous goods shipments are stored, handled, loaded and stowed in accordance with the requirements of the Technical Instructions. With the temperature on the ramp in summer exceeding 40°C in many parts of world, and with some areas reaching 50°C, the absence of a visual warning on packages means that compliance with SP A20 may be compromised. It was therefore proposed that a new handling label should be included in Part 5, Chapter 3 that shippers would have to apply to packages containing substances to which Special Provision A20 applies.

2.8.1.3 Some members believed this was a multimodal issue and should be submitted to the UNSCOE, noting that for reasons of hazard communication, similar labels might be developed under the Globally Harmonized System of Classification and Labelling of Chemicals. It was explained a paper on requiring a special label for organic peroxides would be discussed at the upcoming December 2003 meeting which, if agreed to, would render this unnecessary. However, a majority believed that for safety reasons, a new handling label was necessary. The proposal was agreed.

2.8.1.4 A member noted that many of the substances to which this label would apply are shipped in small packages. This would make application of the label difficult unless a smaller label could be used. He therefore suggested that a label with dimensions half those of the standard size should be allowed on small packages. The meeting agreed and added appropriate text to the label specification.

2.8.1.5 A proposal to make a parallel change to 5; 3.4.2 was discussed, but it was considered that this needed closer examination and should be studied further during the next biennium.

2.8.2 Amendment to Limited Quantity Marking (DGP/19-WP/25)

Attention was drawn to the limited quantity marking requirements of 5; 2.4.10 and 3; 4.5.2 which indicate that packages of dangerous goods in limited quantities must be marked to indicate that they contain "limited quantities". The use of quotation marks suggests that the only correct marking would be "limited quantities" as opposed to allowing abbreviations or showing "quantity" in the singular form. It is common industry practice to use the marking "limited quantity" or the abbreviated marking "LTD QTY." Both the singular term and the abbreviation are allowed by the Technical Instructions on the air transport document (see 3;4.6 and 5;4.1.5). It was therefore suggested that, for purposes of continuity and clarity, "limited quantity(ies)" and "LTD QTY" should be listed as acceptable markings for limited quantities of dangerous goods. The meeting agreed with this proposal.

2.8.3 Information to Pilot-in-Command (DGP/19-WP/27 and IP/6)

2.8.3.1 A member suggested that there were inconsistencies between Part 7;4.1.1 f) (Information to Pilot-in-Command), Part 5;4.1.5.1 (total quantity for dangerous goods) and Packing Instruction 910 paragraphs k) and l), concerning quantity of dangerous goods specifically. These discrepancies made it difficult or impossible to complete the NOTOC properly using the information available on the transport document.

> Part 5;4.1.5.1 requires the total quantity for dangerous goods with the same shipping name and UN number
>
> Packing Instruction 910 requires the average mass of the packages
>
> Part 7;4.1.1 (f) requires the total quantity and an indication of the quantity of the largest and smallest package at each loading location for dangerous goods with the same shipping name and UN number

These discrepancies made it difficult or impossible to complete the NOTOC properly using the information available on the transport document.

2.8.3.2 It was suggested that making these provisions fully compatible would be difficult and cumbersome. To align the requirements and at the same time keeping them relatively simple, it was consequently proposed to make additions to all three, as well as removing the requirement for quoting the average mass of the packages in Packing Instruction 910 l) and deleting the requirement “at each location” from 7;4.1.1 (f).

2.8.3.3 Concerning Packing Instructions 910, l), it was suggested that allowing an average mass of the packages to be quoted would not give an indication of the mass of the heaviest packages and consequently it could not be determined if it exceeded the limit for a single package. There was also a concern that the requirement to state the number of packages had also been lost, but it was determined that this requirement was still contained in 5; 4.1.5.1. It was suggested that the Technical Instructions should revert to the original

text requiring the number of packages to be indicated as well as the net quantity (or gross quantity if applicable) in each package of a consignment of packages containing dangerous goods with the same UN number. The meeting was reminded, however, that the requirement to quote an average mass had been deliberately introduced to cater for consumer commodities (to which Packing Instruction 910 applied) to allow for the fact that these commodities were often shipped together in packages of varying sizes. The meeting agreed that the proposed change to paragraph l) of Packing Instruction 910 would enable the NOTOC to be completed adequately.

2.8.3.4 It was pointed out that 7; 4.1.1 f) of the Technical Instructions requires, for a consignment of multiple packages of dangerous goods with the same UN number and shipping name, the total quantity of the dangerous goods and an indication of the quantity of the largest and smallest packages at each loading location to be shown on the NOTOC. However, this cannot be done if a consignment is split between different loading locations. On one hand, it was stated that pilots had a need to know precisely where all dangerous goods were stowed, but on the other hand, the shipper would not know that the consignment would be split. It was suggested that this could be overcome by marking each package with the total net quantity, but this was considered to be an unacceptable burden to place on a shipper. It was agreed that this was a difficult problem which the panel would need more time to study.

2.8.3.5 The meeting reviewed proposed revised text for 5;4.1.5.1 of the Technical Instructions to take account of some of the concerns expressed. This included a requirement that the shipper had to mark the net quantity on each package. Although this would in theory allow an operator to determine the total quantity in each location in the case of the split consignment, as mentioned in 2.14.2.4 above, it was considered to be an excessive burden on the shipper and difficult for the operator in practice.

2.8.3.6 The existence of the overall problem was noted, but, in view of the difficulties experienced by many members with the proposed solutions, it was agreed to defer further discussion at the DGP/19 meeting. It was agreed that members would consult with colleagues in the home States and that the matter would be discussed further during the coming biennium.

2.8.4 **Air Eligibility Marking (DGP/19-WP/41)**

2.8.4.1 A member drew attention to the DGP/18 decision and subsequent working group discussions on the introduction of the "air eligibility" marking requirement to indicate that the shipper has determined that a packaging meets the applicable air transport requirements. Although it was generally agreed that there were additional requirements for packagings/packages intended for transport by air in comparison with the other modes of transport, it was suggested that several authorities and a majority of the industry were of the opinion that the air eligibility marking had not achieved its objectives. Outer packagings with preprinted air eligibility markings were already on the market and shippers had acquired them in the belief that they complied with all the requirements for air transport, which defeated the objective. It was therefore suggested that, rather than having a marking on the package, the Technical Instructions should clearly stipulate in some dedicated sections (e.g. packing instructions, shipper's responsibilities) the differences between the air mode and the other modes of transport. It was thought that the reformatting of the packing instructions was a good opportunity to highlight these differences. It might also be desirable to extend the statement on the dangerous goods transport document.

2.8.4.2 Other members supported this proposal. It was pointed out that the shipper's declaration on the transport document was intended to attest that all the requirements of the Technical Instructions had been met and this marking was only a duplication of that requirement. Moreover, it could be seen by shippers and cargo acceptance staff as a reason for not carrying out a comprehensive check that the packaging did in fact meet all the relevant requirements. There was no guarantee that, where the mark appeared on an outer packaging, any required inner packagings also met the requirements of the Technical Instructions. There was also the possibility that the marking could be used in mitigation in enforcement actions concerning improper packaging.

2.8.4.3 Some members disagreed with this proposal. It was admitted that there was some confusion among shippers concerning use of the markings which had led to misuse, but this was a problem of properly educating packers and shippers, not a problem with the marking itself. It was pointed out that the introduction of the marking had itself focussed the attention of shippers on the fact that packagings for air transport were necessarily more stringent than for surface modes.

2.8.4.4 Practical difficulties would arise from requirement to use the label if it were deleted from the Technical Instructions at this time. It was recalled that it had been originally intended that it should come into use on 1 January 2003, but this had been changed to 1 January 2004 because of implementation difficulties. Many packagings had already been manufactured with the marking already incorporated and it would not be reasonable to say at this late stage that they could not be used. One member stated that use of the label had already been included in his State's regulations and if it were to be deleted from the Technical Instructions his State would probably be forced to file a variation, which would complicate the international movement of dangerous goods by air. Another member indicated that a similar marking had been used for ten years without any problems arising from it.

2.8.4.5 The Secretary pointed out the difficulties in making such a change so close to the implementation date (i.e. 1 January 2004). A change so soon after the initial decision (at DGP/18) would be a blow to the panel's credibility. Moreover, the time between the end of the DGP/19 meeting and the implementation date was less than eight weeks. During this time, the approval of the Air Navigation Commission (ANC) and the Council of ICAO would have to be obtained and all States would have to be informed and change their own plans for implementation. The ANC and Council would only be in session for a further four weeks and already had full agendas for the period. They might not therefore be able to consider this proposal in the time available.

2.8.4.6 Some suggestions for compromise solutions were put forward. The possibility of deferring implementation until 1 January 2005 was proposed, accompanied by an intensive awareness campaign aimed at shippers to explain the significance of the marking. Another suggestion was to require the equivalent of the marking on the transport document, while allowing the marking to appear on the package as an option.

2.8.4.7 A large majority of members indicated that they were in favour of deleting the requirement for the marking and, as a compromise, those favouring its retention agreed that they could accept deletion if the objective of the requirement could be achieved in other ways. It was confirmed that packagings bearing the marking could still be used, even though they were not required – this would reflect the present practice.

2.8.4.8 It was agreed to delete the mandatory requirement for use of the marking from 1 January 2004, but, to avoid a discontinuity of the Technical Instructions requirements, it was also agreed to maintain the present statement (appearing in the Note following 5; 2.4.12) which allows the marking to be used, extending the date until 1 January 2005. Upon further consideration it was agreed to be preferable to modify 5; 2.4.12 to delete the date and make the remainder of the text a recommendation instead of a requirement. The Note was deleted. Approval of the Air Navigation Commission and Council of ICAO would need to be sought to issue this change as an addendum to the current (2003-2004) edition of the Technical Instructions.

2.8.4.9 Detailed amendments to the Technical Instructions to remove other references to the marking and to stress the special packing requirement for the air mode were also developed. Significant among these was an addition to the shipper's declaration on the transport document requiring the shipper to attest to having met all the applicable requirements for air transport. It was agreed that these amendments, which would be included in the 2005/2006 version of the Technical Instructions, should also be included for information in the addendum, to warn the industry of the changes to be expected in the new version. It was also agreed that the contents of the addendum should be posted on the ICAO and IATA websites as soon as Council approval had been obtained.

2.8.4.10 In light of the foregoing discussion, the following recommendation was developed:

Recommendation 2/1 — Amendment to the Technical Instructions

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

It was noted that for the 2005/2006 edition of the Technical Instructions, 5; 2.4.12 would be deleted.

2.8.4.11 It was mentioned that shippers would have possibly very large inventories of transport document forms in stock which would have to be changed because of the change to the declaration. It may therefore be necessary to consider a transition period for the introduction of the new declaration.

2.8.5 Sequence of information on the transport document (DGP/19-WP/31)

2.8.5.1 It was recalled that DGP/18 had discussed the decision of the previous UNSCETDG meeting (See DGP/18 report 2.1.7.1) to change the basic sequence of information on the transport document so that the UN number appears first, to be followed by the proper shipping name. After considerable discussion, DGP/18 had agreed that there was a need for a transition period and that the long-term goal should be a single sequence. DGP/18 also agreed that:

a) the present aviation sequence would continue to be accepted for a two-year transition period; and

b) the two UN alternative sequences would also be acceptable for air transport.

The meeting also agreed that ICAO would support an IATA request for the discussion to be reopened at the UNSCETDG.

2.8.5.2 IATA had subsequently decided that, with effect from 1 January 2005, the only sequence permitted by its regulations should be that beginning with the UN number (i.e. that currently appearing as the sequence a), b), c), d) in 5; 4.1.4.2 of the Technical Instructions). The UNSCETDG had expressed concern over this course of action and IATA had consequently changed the date to 1 January 2007.

2.8.5.3 It was now being proposed that DGP should endorse the use of the single sequence and agree to an implementation date of 1 January 2007. An appropriate amendment to the Technical Instructions was presented.

2.8.5.4 The meeting agreed that a single sequence was desirable, but it noted that the UNSCETDG had not yet agreed to the suggested implementation date, although it was expected to do so at its meeting in December of 2003. It was therefore agreed not to change the Technical Instructions at this time but to include a note advising that the change would be made, becoming effective on 1 January 2007. It was agreed that the final inclusion of this note would be left to the Secretary, depending on whether or not the UNSCETDG agreed upon the 1 January 2007 date.

2.8.6 Information required in addition to the Dangerous Goods Description (DGP/19-WP/35)

2.8.6.1 It was pointed out that Part 5; 4.1.5.8.1 (b) requires "a statement indicating that the shipment is within the limitations prescribed for either passenger and cargo or cargo-aircraft only as appropriate." It was stated that it has become an industry practice to allow both categories on the same transport document, thereby indicating that all items on the document are prepared for either passenger and cargo or cargo-aircraft only. This practice provides erroneous information, adds confusion for acceptance staff and impedes a smooth and efficient acceptance process of the operator. It was suggested that the addition of a clarification sentence indicating that separate transport documents are required for passenger and cargo and cargo aircraft only shipments would eliminate this confusion.

2.8.6.2 Some support was expressed for this proposal – especially since it was possible in the future that the same Packing Instructions could be used for passenger aircraft and cargo aircraft only shipments. However, it was suggested that it would remove flexibility from the shipper and increase shipping costs. The meeting did not agree to change the Technical Instructions.

2.8.7 “Overpack” marking

2.8.7.1 It was noted that the UNSCETDG had introduced a requirement to mark overpacks with the word “Overpack” in addition to existing requirements for overpack marking and labelling, unless markings and labels representative of all dangerous goods in the overpack were visible. The “Overpack” marking was to be an indication that all packages inside the overpack complied with all provisions of the requirements. Amendments to the Technical Instructions to incorporate this marking were presented for the meeting’s review.

2.8.7.2 The proposed amendments were discussed in detail and a number of changes were made before the text was agreed. It was noted in passing that the existing text of 5;2.4.9 a) used the expression "special handling instructions", but there was no indication of what such instructions were. It was agreed to look into this matter during the next biennium.

2.9 OPERATOR'S RESPONSIBILITIES (Part 7)

2.9.1 Transport of dangerous goods on passenger aircraft without Class B or C main deck cargo compartments (DGP/19-WP/16)

At a working group meeting, it had been explained that the decision taken at DGP/18 to simplify the provisions relating to the transport of certain types of dangerous goods on aircraft not equipped with Class B or C main deck cargo compartments had resulted in a number of dangerous goods, which were unsuitable for such transport, being inadvertently included in the list of permitted items. The Working Group had recognised the problem and had agreed to a means of resolving the issue which involved adding a list of exclusions to S-7; 2.2.2. Further work to update the list in accordance with the latest edition of the Technical Instructions had since been done and was presented to the meeting for its review. The meeting approved the list.

2.9.2 Addition of "Cosmetics" to Part 7, Chapter 6 (Provisions to aid recognition of undeclared dangerous goods)(DGP/19-WP/33)

2.9.2.1 An observer suggested that certain consumer cosmetics, which may qualify as dangerous goods, are commonly offered to operators for transport as non-hazardous goods. "Cosmetics" is a broad term that includes such items as finger nail polish and nail polish remover, both of which may contain flammable liquids. In addition, other types of cosmetic products are flammable aerosols or other articles that may qualify as dangerous goods. An additional definition was therefore proposed for addition to 7; 6.1.

2.9.2.2 Some members agreed that this proposal would help in promoting passenger awareness and the training of passenger handling staff. Others however considered that the list was not exhaustive and that there were many things which could be added, of which cosmetics were probably among the least dangerous. In the interests of not extending the list, they were against the addition. The meeting decided, by a small margin, not to make the addition.

2.9.3 Loading of magnetized materials (DGP/19-WP/51)

2.9.3.1 A member drew attention to the current provisions of the Technical Instructions (Part 7; Para. 2.10) concerning the loading of magnetized materials. He stated that, in practice, these were not helpful to loading personnel and, in any case, ignored the fact that modern aircraft were not affected by magnetized materials. He sought clarification on the practical application of the provisions and suggested an amendment to the Technical Instructions indicating that the requirements did not apply to modern aircraft.

2.9.3.2 Most members were of the view that even large modern aircraft could still be affected by magnetic materials and this was certainly the case with smaller aircraft, however new. The proposed amendment to the Technical Instructions was therefore withdrawn.

2.9.3.3 The advice of members was nevertheless still sought on the implementation of the present provisions. Concerning how the requirements are met during the acceptance or loading process, it was agreed that there was considerable uncertainty. It was suggested that advice might be obtained from aircraft manufacturers. It was further suggested that this subject might be reviewed in more depth for further discussion at DGP/20.

2.9.4 Acceptance Checklists – Excepted Quantities/Excepted Packages (DGP/19-WP/57)

A member suggested that the wording of 7; 1.3 of the Technical Instructions implied that an operator must use an acceptance checklist when accepting packages or overpacks containing dangerous goods in excepted quantities, and radioactive material in excepted packages, even though there is no stated requirement in 1; 2.4 and 2; 7.9 respectively. He therefore proposed adding text to 7; 1.3 c) to indicate that a checklist was not required for dangerous goods in excepted quantities and radioactive material in excepted packages. The meeting agreed in principle with the proposed amendment but decided that the text was more suitable for a Note.

2.9.5 Information to passengers

2.9.5.1 Part 7;5.1.2 b) of the Technical Instructions requires notices to be displayed at various locations at an airport to warn passengers about the types of dangerous goods which they are forbidden from carrying on an aircraft. Chapter 1.1 of the Supplement to the Technical Instructions places a requirement on a State to ensure that such information is promulgated appropriately. It is now common for check-in desks to be used by a number of operators at different times; these desks are often under the control of airport authorities and it can sometimes be difficult for operators to comply with the requirements of 7;5.1.2 b) due to restrictions on their use (and of ticket sales points) and also because these areas at an airport will be used by many other operators. It is suggested that where national legislation permits, it would assist the situation if airport authorities were subject to a similar responsibility to that of the operator.

2.9.5.2 Two alternative ways of overcoming this difficulty were proposed:

a) a simple amendment to 7;5.1.1 of the Technical Instructions to include the airport operator with the operator;

or

b) addition of a new paragraph at the end of Chapter 1.1 of the Supplement to the Technical Instructions which would require airport operators to take action, but subject to national legislation.

The second option was included because it was anticipated that in some States, dangerous goods legislation could not be applied to airport operators.

2.9.5.3 Members decided by a significant majority that the first option was preferable and an amendment to the Technical Instructions was agreed. It was mentioned that there had been a similar problem in the past in the case of travel agents, but no difficulties appeared to have arisen in States.

2.10 PROVISIONS FOR PASSENGERS AND CREW (Part 8)

2.10.1 Review of the Provisions of Part 8 (DGP/19-WP/26)

2.10.1.1 A member reported an incident in which an aerosol can of hairspray had caught fire in a passenger's bag at an airport. It had been concluded that the fire was caused by the release of the cap on the hairspray contained in the bag, the subsequent depression of the valve releasing the contents of the aerosol container and the ignition of the hairspray by static electricity.

2.10.1.2 This incident had raised a number of questions regarding the provisions of Part 8, such as:

— Are there clear criteria, internationally recognized, for determining what constitutes medicinal or toilet articles?

— What criteria are used to determine if an item of dangerous goods is suitable for inclusion in Part 8?

— Some of the provisions in Part 8;1.1.2 have been there for an extended period of time. What review process is in place to ensure they continue to be relevant and safe?

— Is there any other way to present the provisions of Part 8 to facilitate their understanding by passengers and crew?

Consideration of these issues had lead to the conclusion that it would be appropriate for DGP to review the provisions of Part 8, and it was suggested that a working group should be established to undertake this task.

2.10.1.3 Several members indicated that they had had incidents similar to the one described above and there was general agreement that a working group should be established. It was agreed that interested members should collect information on incidents and other aspects of the subject so that the working group could begin useful work as soon as possible. It was also agreed that an input from experts in the aerosol field should be sought. The presenter of the proposal agreed to be rapporteur of the working group.

2.10.1.4 It was noted that in the specific incident described, the lack of the cap on the aerosol can had been critical and it was considered that this issue could be addressed now with an amendment to Part 8. The meeting consequently agreed an addition to 8; 1.1.2b).

2.10.2 **Division 2.2 gases in passenger baggage**

2.10.2.1 A member drew attention (DGP/19-WP/30) to Part 8; 1.1.2 which lists those substances and articles of dangerous goods that passengers and crew members are permitted to carry in checked and/or carry-on baggage or on their person. This list of articles and substances had expanded over time as new items, had been developed that incorporate or contain dangerous goods, particularly in the area of sporting equipment or consumer devices. This was particularly the case with small cylinders of Division 2.2 gases. There are currently three specific exemptions applicable to dangerous goods carried by passengers and crew that contain Division 2.2 gases in 8;1.1.2, concerning mechanical limbs, self inflating life jackets and avalanche back packs.

2.10.2.2 However, it was stated that the inclusion of these additional items was presenting operators with challenges in explaining to passengers why one item containing a small cylinder was acceptable, but another article containing the same cylinder was not acceptable. To avoid this conflict it was proposed that the current three entries be combined into one that permits up to four cylinders, up to a defined size, containing a Division 2.2 gas. An amendment to 8; 2.11 d) was therefore proposed, with the deletion of 8; 2.1.1 m) and p).

2.10.2.3 Another member drew attention (DGP/19-WP/17) specifically to Part 8; 1.1.2 d) which provides for passengers to wear small carbon dioxide gas cylinders for the operation of mechanical limbs. He pointed out that non-flammable gases other than carbon dioxide (e.g., nitrogen) were being used in this type of equipment and suggested the Technical Instructions should be amended to reflect this. An amendment to 8; 1.1.2 d) was proposed using the same form of words as used in 8; 1.1.2 m).

2.10.2.4 The amendment mentioned in 2.16.2.2 above was agreed in principle, however it was considered that the text should be made clearer. Since the items were not urgent, it was agreed that the task of improving the text could be assigned to the working group to be established (see 2.16.1.3 above).

2.10.2.5 It was however agreed that the alleviation sought for wearers of mechanical limbs could be introduced now. A revised text was consequently developed for 8; 1.1.2 d).

2.11 **EMERGENCY RESPONSE GUIDANCE FOR AIRCRAFT INCIDENTS INVOLVING DANGEROUS GOODS (DOC 9481) (DGP/19-WP/10)**

Amendments to Doc 9481 arising from the Montreal meeting of the Working Group of the Whole were agreed on the basis of an editorial correction in Table 4-1 and are shown in Appendix B to the report on this agenda item

2.12 MISCELLANEOUS ITEMS

2.12.1 Results of recent meetings hosted by ADR/RID concerning the requirements for dangerous goods transport documents in all modes (DGP/19-WP/46)

2.12.1.1 A member reported on the outcome of two meetings hosted by ARD/RID on dangerous goods transport documentation.

The objectives of the meetings had been to:

a) establish and assess differences between the different modes;

b) make proposals to optimise compatibility across the modes; and

c) establish whether any solutions were in accordance with RID/ADR regulations.

DGP/19 discussed the results of the meeting and agreed on action by DGP where necessary.

2.12.2 Date of the transport document

a) It had been noted that Part 5;4.1.3 of the Technical Instructions did not align with the UN Model Regulations in that it omitted the text "The date of the Dangerous Goods Transport Document or an electronic copy of it was prepared or given to the initial carrier shall be included". Reference to this date, however, is retained in the title of the paragraph. The date of signing the shipper's certification is included in the Technical Instructions (5;4.1.6.1) and UN Model Regulations (5.4.1.6.1) and it had been felt that to have two dates on the document was anomalous. It was suggested that the UN be asked to consider requiring only one date. DGP/19 needed to consider whether to align with the current UN text or delete the reference to date in the paragraph heading for 5;4.1.3; and

b) It was suggested that the correct course of action would be to adopt the full UN text and to question the UN subsequently on the need for this date. It was not believed that it was the UNSCETDG’s intention to require two dates. The meeting agreed to delete “date” from the title of 5; 4.1.3.

2.12.2.1 Packing Instruction on the transport document

a) Concern had been expressed by the meeting that the air mode was the only one which required the Packing Instruction to be quoted on the Transport Document. The meeting had been advised that it was there to enable acceptance staff to verify that the correct Packing Instruction had been used by the shipper, depending on whether the consignment was to travel on a cargo or passenger aircraft, and also provided for

verification that a permitted type of packaging had been used. Notwithstanding this explanation, the meeting asked DGP to reconsider whether retention of the Packing Instruction was justified, given that no other mode requires it. With the Packing Instruction rationalisation exercise, which may result in both passenger and cargo aircraft being addressed by the same Packing Instruction, part of the air mode's justification may be removed.

b) It was agreed that this subject would arise again when the discussion on packing instructions took place. No action was therefore contemplated for the time being.

2.12.2.2 **Statement re use of overpack**

a) Concern had been expressed by the meeting that the air mode was the only one which required the statement "overpack used". It was believed that this stemmed from the previous requirement for the quantity per package to be stated; it would be confusing for an operator to be presented with a document stating "10 x 5kg" but only 1 package (overpack). DGP was again requested to review the requirement for "overpack used" to be stated on the Transport Document;

b) The meeting agreed that this requirement was useful for the air mode and should be useful for other modes also. It was therefore agreed to suggest to RID/ADR that they propose to the UNSCETDG that the requirement be introduced for all modes.

2.12.2.3 **Net mass of explosives**

a) It had been noted that ICAO had not aligned with the UN in respect of Class 1 in 5;4.1.5.1 in that the UN requires the net explosive mass to be quoted whilst this requirement has been omitted in the Technical Instructions. Clarification from DGP/19 was sought on why the UN text had been omitted.

b) It was noted that the Technical Instructions requires the net mass of the explosive articles to be quoted, but not the mass of the explosive contained therein. The reason for not requiring the mass of explosives, which it was agreed was of interest, was not readily apparent and search of documentation would be undertaken to determine if it was recorded. The mass of the complete article was useful since it was the only quantity which could be readily checked by an operator. It was noted that ICAO had only been asked for clarification and there was no proposal to amend the Technical Instructions at present.

2.12.2.4 **Shielding self reactive substances and organic peroxides from heat and sunlight**

a) It had been noted that the air mode was the only one requiring a statement on the Transport Document to the effect that self reactive substances of Division 4.1 and organic peroxides must be shielded from heat/ sunlight, and the DGP was asked to consider whether this was in fact necessary.

b) This was considered to be a multi-modal issue which should be considered by the UNSCETDG. It was recalled that the UN was to be informed of ICAO's adoption of a label relating to shielding from heat and light (see 2.10 of this report) and this related point could be brought to the Sub-Committee's attention at the same time.

2.12.2.5 **Signed certification on the transport document**

a) It had been suggested that since road and rail mode did not require a signed certification on the Transport Document, the air and sea modes should be asked to review their need for such a requirement. It had been stated that the air mode would probably wish to retain this requirement as it was particularly useful for enforcement purposes. Furthermore, it had been suggested that the wording of the certification could usefully be extended to include reference to the fact that all applicable modal requirements had been met. The meeting agreed this was a good idea and would be suggested to the UN; and

b) The meeting was informed that the sea mode also required a signed certification and this was a requirement of the Convention, which was most unlikely to be changed. It was agreed that this was another topic which should be raised at the UNSCETDG.

2.12.2.6 It was agreed that the DGP's views on these subjects would be passed to RID/ADR.

2.12.3 OPENING OF PACKAGES BY CUSTOMS AND OTHER AUTHORITIES (DGP/19-WP/39)

2.12.3.1 A member recalled the working group discussion on the problem of packages containing dangerous goods being opened by Customs or other authorities and then being resealed without expert guidance. Following that discussion, he now proposed a text for inclusion in Part I of the Technical Instructions for the meeting's consideration, similar to that contained in paragraph 581 of the IAEA Regulations (TS-R-1).

2.12.3.2 Members reiterated that this was a problem in their States. As well as Customs authorities, the dangerous goods authorities in some States had the authority to open suspect packages, although this was not the case in other States. A major problem arose when, as sometimes happened, Customs authorities opened package and then put them back into the transport system without informing the dangerous goods authorities.

2.12.3.3 The meeting agreed that any opening and repackaging had to be done by qualified persons; one member was of the opinion that only the shipper was competent to do so, although this would often by impractical. There was considerable discussion however about who would be responsible for repackaging. some members felt it should be the agency that opened the packaging, noting that the task was often left to the operator. The meeting agreed that it could not be specific on this point and confined itself to a requirement in Part 1 of the Technical Instructions stating that opened packages must be restored to their original condition before continuing their journey.

2.12.3.4 It was noted that the Secretary would pass the proposed amendment to the appropriate Section in the ICAO Secretariat for transmission to the World Customs Organization for its information.

2.13 RECOMMENDATION

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

Recommendation 2/2 — Amendment to the Technical Instructions

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

— — — — — — — —

APPENDIX A

. . .

PART 2 — CLASSIFICATION OF DANGEROUS GOODS

. . .

CHAPTER 7 — CLASS 7 — RADIOACTIVE MATERIAL

. . .

7.9 REQUIREMENTS AND CONTROLS FOR TRANSPORT OF EXCEPTED PACKAGES

. . .

~~7.9.7 Excepted packages must be marked to indicate that the shipper has determined that the packaging meets the applicable air transport requirements. The marking must be as specified in 5;2.4.12.~~

— — — — — — — —

PART 4 — PACKING INSTRUCTIONS

. . .

CHAPTER 8 — CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

. . .

650	PACKING INSTRUCTION 650	650

General provisions

…

For transport each package must be clearly and durably marked with the words “DIAGNOSTIC SPECIMENS”. When an air waybill has been issued it must contain the words “DIAGNOSTIC SPECIMENS”. Each package ~~must~~ may also be marked to indicate that the shipper has determined that the packaging meets the applicable air transport requirements as specified in 5;2.4.12. The marking must be applied adjacent to the words “DIAGNOSTIC SPECIMENS”

. . .

CHAPTER 11 — CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

. . .

910	PACKING INSTRUCTION 910	910

Consumer commodities are materials that are packaged and distributed in a form intended or suitable for retail sale for 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 Part 4, Chapter 1 or Part 6 of these Instructions; they must, however, comply with all other applicable requirements.

.....

m) Packages ~~must~~ may be marked to indicate that the shipper has determined that the packaging meets the applicable air transport requirements as specified in 5;2.4.12.

— — — — — — — —

PART 5 — SHIPPER'S RESPONSIBILITIES

. . .

CHAPTER 2 — PACKAGE MARKINGS

. . .

2.4.12 Air eligibility marking

~~From 1 January 2004,~~ ~~packagings~~, Packages, including those used for limited quantities of dangerous goods, ~~must~~ may be marked to indicate that the shipper has determined that the ~~packaging~~ package meets the applicable air transport requirements. The marking ~~must~~ should be applied as prescribed in 2.2 and must be placed adjacent to the markings prescribed in 2.4.1, ~~or for limited quantity packagings, adjacent to the marking prescribed in 2.4.10~~. The marking must be durable, legible and of such a size relative to the ~~packaging~~ package as to be readily visible. The marking ~~must~~ should include the symbol consisting of an aircraft within a circle as shown below and may include the words "Air Eligible".

~~*Note.— This marking may be applied to packagings from 1 January 2003.*~~

— — — — — — — —

PROPOSED AMENDMENTS TO THE
***TECHNICAL INSTRUCTIONS FOR THE SAFE TRANSPORT OF DANGEROUS GOODS BY AIR* (Doc 9284),**
2005-2006 EDITION
APPLICABLE FROM 1 JANUARY 2005

. . .

PART 4 — PACKING INSTRUCTIONS

INTRODUCTORY NOTES

. . .

Note 9.— Additional requirements for the air mode

The transport of dangerous goods by air is subject to requirements additional to those of other modes of transport (e.g. quantity limitations, requirements for absorbent material, pressure differential requirements, appropriate closure procedures, specific packing instruction requirements.)

— — — — — — — —

PART 5 — SHIPPER'S RESPONSIBILITIES

CHAPTER 1 — GENERAL

Note.— It is the shipper's responsibility to ensure that all of the applicable air transport requirements are met. The items indicated below are provided as examples and do not include a complete list of all the applicable requirements for air transport.

1.1 GENERAL REQUIREMENTS

Before a person offers any package or overpack of dangerous goods for transport by air that person must ensure that:

a) the articles or substances are not prohibited for transport by air (see Part 1, Chapter 2);

b) the goods are properly classified, ~~packaged,~~ marked and labelled and otherwise in a condition for transport as required by these Instructions;

c) the dangerous goods are packaged in compliance with all the applicable air transport requirements including:

- inner packaging and the maximum quantity per package limits;

- appropriate types of packaging according to the packing instructions;

- other applicable requirements indicated in the packing instructions including:
  - single packagings may be forbidden;
  - only inner and outer packagings indicated in the packing instructions are permitted;
  - inner packaging may need to be be packed in intermediate packagings; and
  - certain dangerous goods must be transported in packagings meeting a higher performance level.

- appropriate closure procedures for inner and outer packagings (see Part 4;1.1.4);

- the compatibility requirements such as those in the particular packing requirements of the packing instructions and in Part 4, Chapter 1;

- the absorbent materials requirements in Part 4; 1.1.10.1 and in the packing instructions when applicable; and

- the pressure differential requirement of Part 4; 1.1.6.

Editorial Note.— consequential renumbering of sub-paragraphs.

— — — — — — — —

CHAPTER 4 — DOCUMENTATION

. . .

4.1.6 Certification

4.1.6.1 The dangerous goods transport document must include a certification or declaration that the consignment is acceptable for transport and that the goods are properly packaged, marked and labelled, and in proper condition for transport in accordance with the applicable regulations and including additional air transport requirements of these Instructions (examples of additional air transport requirements are indicated in 5;1.1). The text for this certification is:

> "I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations."

For air transport the following additional statement is required:

> "I declare that all of the applicable air transport requirements have been met."

The certification must be signed and dated by the shipper. Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures.

Note.— The word "placarded" is not essential for shipments by air.

— — — — — — — —

APPENDIX B

***Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods, 2003-2004 Edition* (Doc 9481)**

Section 2

GENERAL CONSIDERATION

2.1 GENERAL

The following are considerations which may need to be taken into account in assessing an appropriate course of action to take in the event of an incident involving dangerous goods. These considerations apply whether the aircraft involved is carrying passengers, cargo or both.

. . .

9) Care should always be taken when mopping up any spillage or leakage to ensure there will be no reaction between what is to be used for mopping up and the dangerous goods. If it appears there could be a reaction, mopping up should not be attempted but the spillage should be covered with polyethylene bags. If polyethylene bags are not available, care should be taken to ensure there will be no reaction between whatever is used to contain the item and the item itself.

10) In case of a spill of known or suspected dangerous goods in powder form, everything affected should be left undisturbed. This type of spill should not be covered with a fire agent or diluted with water. Passengers should be moved away from the area. Switching off re-circulation fans should be considered. The area of the spillage should be covered using polyethylene or other plastic bags and blankets. After this the area should be kept isolated, after landing only qualified specialists should deal with the situation.

Editorial Note.— other paragraphs need to be renumbered.

— — — — — — — —

Section 3

EXAMPLES OF DANGEROUS GOODS INCIDENTS CHECKLISTS

. . .

3.4 AMPLIFIED CABIN CREW CHECKLIST FOR DANGEROUS GOODS INCIDENTS IN THE PASSENGER CABIN DURING FLIGHT

. . .

PLACE DANGEROUS GOODS ITEM IN POLYETHYLENE BAGS

Note — In the case of a spill of known or suspected dangerous goods in powder form

- leave everything undisturbed
- do not use fire agent or water
- cover area with polyethylene or other plastic bags and blankets
- keep area isolated until after landing

With emergency response kit

If it is absolutely certain that the item will not create a problem the decision may be made not to move it. In most circumstances, however, it will be better to move the item and this should be done as suggested below. Place the item in a polyethylene bag as follows:

— prepare two bags by rolling up the sides and placing them on the floor;
— place the item inside the first bag with the closure of the item, or the point from which it is leaking from its container, at the top;

— — — — — — — —

Section 4

CHART OF DRILLS AND LIST OF DANGEROUS GOODS WITH DRILL REFERENCE NUMBERS

. . .

4.1 AIRCRAFT EMERGENCY RESPONSE DRILLS

. . .

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	Fire-Fighting Procedure	Additional Considerations
. . .						
11	Infectious substances may affect humans or animals if inhaled, ingested or absorbed through the mucous membrane or an open wound.	Contamination with Infectious Substances	Delayed infection to humans or animals.	Do not touch. Minimum recirculation and ventilation in affected area.	All agents according to availability. No water on 'Y' drill letter	Call for a qualified person to meet the aircraft

DRILL LETTER	ADDITIONAL RISK	DRILL LETTER	ADDITIONAL RISK

A	ANAESTHETIC	P	TOXIC* (POISON)
C	CORROSIVE	S	SPONTANEOUSLY COMBUSTIBLE OR
E	EXPLOSIVE	W	PYROPHORIC
F	FLAMMABLE	X	IF WET GIVES OFF POISONOUS OR
H	HIGHLY IGNITABLE		FLAMMABLE GAS
I	IRRITANT / TEAR		OXIDIZER
L	PRODUCING OTHER RISK LOW OR NONE	Y	DEPENDING ON THE TYPE OF INFECTIOUS SUBSTANCE THE APPROPRIATE NATIONAL AUTHORITY MAY BE REQUIRED TO QUARANTINE INDIVIDUALS, ANIMALS , CARGO AND THE AIRCRAFT.
M	MAGNETIC		
N	NOXIOUS		

* Toxic has the same meaning as poison.

. . .

Table 4.2 Alphabetical list of dangerous goods with drill codes

UN No.	Drill Code	Proper Shipping Name
. . .		
2900	**11Y**	**Infectious substance, affecting animals**
2814	**11Y**	**Infectious substance, affecting humans**
. . .		

— — — — — — — —

APPENDIX C

AMENDMENTS TO THE TECHNICAL INSTRUCTIONS

PART 1 — GENERAL

CHAPTER 1 — SCOPE AND APPLICABILITY

. . .

1.3 TRANSPORT OF RADIOACTIVE MATERIAL

. . .

1.3.2.6 Non-compliance

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

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

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

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

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

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

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

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

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

Secretarial Note.— Renumber remaining paragraphs

— — — — — — — —

1.3 Dangerous goods packages opened by Customs and other Authorities:

~~Operations involving the inspection of a package shall be carried out only in a place where adequate means are provided and in the presence of qualified persons.~~ Any package opened during an inspection must, before being forwarded to the consignee, be restored to its original condition by qualified persons.

— — — — — — — —

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 ~~passenger~~ 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.

. . .

2.3 DANGEROUS GOODS IN AIR MAIL

2.3.1 In accordance with the Universal Postal Union (UPU) Convention, dangerous goods as defined in these Instructions, with the exception of those listed below, are not permitted in the mail. National ~~P~~postal ~~P~~authorities should ensure that the provisions of the UPU Convention are complied with in relation to the transport of dangerous goods by air.

2.3.2 The following dangerous goods may be acceptable in mail for air carriage subject to the provisions of the ~~N~~national ~~P~~postal ~~A~~authorities concerned and these Instructions which relate to such material, except that the provisions concerning documentation (Part 5, Chapter 4) do not apply to the radioactive material described in b) below:

a) infectious substances and solid carbon dioxide (dry ice) when used as a refrigerant for infectious substances; and

b) radioactive material, the activity of which does not exceed one-tenth of that listed in Table 2-~~12~~11.

— — — — — — — —

CHAPTER 3 — GENERAL INFORMATION

3.1 DEFINITIONS

3.1.1 The following is a list of definitions of commonly used terms in these Instructions. Definitions of terms which have their usual dictionary meanings or are used in the common technical sense are not included. Definitions of additional terms used solely in conjunction with radioactive material are contained in Part 2;7.2.

. . .

Elevated temperature substance. A substance which is transported or offered for transport:

- in the liquid state at a temperature at or above 100 °C;
- in the liquid state with a flashpoint above 60.5 °C and which is intentionally heated to a temperature above its flashpoint; or
- in a solid state and at a temperature at or above 240 °C.

. . .

Freight forwarder. A person or organization who offers the service of arranging the transport of cargo by air.

. . .

GHS. The Globally Harmonized System of Classification and labelling of Chemicals, published by the United Nations as document ST/SG/AC.10/30.

. . .

***Manual of Tests and Criteria*.** The ~~third~~ fourth revised edition of the United Nations publication entitled *Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria* (ST/SG/AC.10/11/ ~~REV.3~~ REV.4 ~~and ST/SG/AC.10/27/Add.2).~~

. . .

***Tank*.** A tank container, portable tank, a road tank vehicle, a rail tank wagon or a receptacle ~~with a capacity of not less than 450 L~~ intended to contain solids, liquids, ~~powders, granules, slurries or solids which are loaded as a gas or liquid and subsequently solidified or of not less than 1 000 L intended to contain~~ or gases and has a capacity of not less than 450 litres when used for the transport of substances of Class 2. A tank container must be capable of being carried on land or on sea and of being loaded and discharged without the need of removal of its structural equipment, must possess stabilizing members and tie-down attachments external to the shell, and must be capable of being lifted when full.

Note 1. — These Technical Instructions do not permit the use of a tank for the transport of radioactive material by air.

Note 2. — The definition of "tank" does not include packages of uranium hexafluoride.

— — — — — — — —

CHAPTER 4 — TRAINING

4.1 ESTABLISHMENT OF TRAINING PROGRAMMES

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

a) shippers of dangerous goods, including packers and persons' or organisations' undertaking the responsibilities of the shippers~~' agents~~;

b) operators;

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

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

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

f) freight forwarders ~~agencies other than operators involved in processing cargo~~; and

g) agencies engaged in the security screening of passengers and their baggage and/or cargo.

. . .

4.2 TRAINING CURRICULA

. . .

4.2.2 Training must be provided or verified upon the employment of personnel identified in the categories specified in Table 1-4. ~~a person in a position involving the transport of dangerous goods by air.~~

4.2.3 Recurrent training must take place within 24 months of previous training to ensure knowledge is current.

Editorial Note.— Renumber subsequent paragraphs.

Table 1-4 Content of training courses

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

KEY

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 (other than dangerous goods)
5 — Staff of freight forwarders involved in the handling, storage and loading of cargo
6 — Operator's and ground handling agent's staff accepting dangerous goods
7 — Operator's and ground handling agent's staff accepting cargo (other than dangerous goods)
8 — Operator's and ground handling agent's staff responsible for the handling, storage and loading of cargo and baggage
9 — Passenger-handling staff
10 — Flight crew members and load planners
11 — Crew members (other than flight crew members)
12 — Security staff who deal with the screening of passengers and their baggage and cargo

Note 1. — Depending on the responsibilities of the person, the aspects of training to be covered may vary from those shown in the table. ~~For example, it may be more appropriate for a packer to cover the aspects with which a shipper should be familiar~~

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

PART 2 — CLASSIFICATION OF DANGEROUS GOODS

. . .

CHAPTER 3 — FLAMMABLE LIQUIDS

3.1 DEFINITION AND GENERAL PROVISIONS

. . .

3.1.4 Liquid desensitized explosives are explosive substances which are dissolved or suspended in water or other liquid substances, to form homogeneous liquid mixture to suppress their explosive properties (see 2.1.3.5.3). Entries in the Dangerous Goods List (Table 3-1) for liquid desensitized explosives are: UN 1204, UN 2059, UN 3064 ~~and~~ UN 3343, UN 3357 and UN 3379.

— — — — — — — —

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

INTRODUCTORY NOTES

. . .

Note 1. – Where the term 'water-reactive' is used in these Instructions, it refers to a substance which, in contact with water, emits flammable gas.

Note 2. – Because of the different properties exhibited by the dangerous goods within Divisions 4.1 and 4.2, it is impractibable to establish a single criterion for classification in either of these divisions. Tests and criteria for assignment to the three divisions of Class 4 are addressed in this chapter and in the Manual of Tests and Criteria, Part III, section 33.

Note 3. – Since organometallic substances can be classified in divisions 4.2 or 4.3 with additional subsidiary risks, depending on their properties, a specific classification flow chart for these substances is given in 2.4.5 of the UN Recommendations on the Transport of Dangerous Goods.

. . .

4.2.4 Division

4.1 — Solid desensitized explosives

4.2.4.1 *Definition*

Solid desensitized explosives are explosive substances which are wetted with water or alcohols or are diluted with other substances to form a homogeneous solid mixture to suppress their explosive properties. Entries in the Dangerous Goods List for solid desensitized explosives are UN Nos. 1310, 1320, 1321, 1322, 1336, 1337, 1344, 1347, 1348, 1349, 1354, 1355, 1356, 1357, 1517, 1571, 2555, 2556, 2557, 2852, 2907, 3317, 3319, 3344 ~~and~~ 3376 and 3380.

. . .

4.2.3.2 *Classification of self-reactive substances*

4.2.3.2.1 Self-reactive substances are classified according to the degree of danger they present.

4.2.3.2.2 Related substances are specifically listed by name in the Dangerous Goods List (Table 3-1). Related substances are UN 2956, UN 3242 and UN 3251.

4.2.3.2.3 Self-reactive substances permitted for transport are listed in 4.2.3.2.4. For each permitted substance listed, ~~Table 2-6 assigns~~ the appropriate generic entry ~~in~~ of the Dangerous Goods List (UN 3221 to 3240) is assigned, and appropriate subsidiary risks and remarks providing relevant information are given. The generic entries specify:

— the self-reactive substance type (B to F);

— the physical state (i.e. liquid/solid); and

— when temperature control is required.

4.2.3.2.4 List of currently assigned self-reactive substances in packages.

The following table (Table 2-6) is reproduced from 2.4.2.3.2.4 in the *UN Recommendations on the Transport of Dangerous Goods* (~~Twelfth~~ Thirteenth revised edition), with irrelevant material removed.

4.2.3.2.5 Classification of self-reactive substances not listed in Table 2-6 and assignment to a generic entry must be made by the appropriate authority of the State of Origin on the basis of a test report. Principles applying to the classification of such substances are provided in 2.4.2.3.3 of the UN Recommendations. The applicable classification procedures, test methods and criteria, and an example of a suitable test report, are given in the current edition of the UN Manual of Tests and Criteria, Part II. The statement of approval must contain the classification and the relevant transport conditions.

4.2.3.2.6 Samples of self-reactive substances not listed in Table 2-6, for which a complete set of test results is not available and which are to be transported for further testing or evaluation, may be assigned to one of the appropriate entries for self-reactive substances type C provided the following conditions are met:

a) the available data indicate that the sample would be no more dangerous than self-reactive substances type B;

b) the sample is packed in a combination packaging consisting of a plastic IP.2 inner packaging with a capacity not exceeding 0.5 L or 0.5 kg which is placed in a wooden box (4C1), plywood box (4D) or fibreboard box (4G) with the maximum net quantity per package not exceeding 1 L or 1 kg; and

c) the available data indicate that the control temperature, if any, is sufficiently low to prevent any dangerous decomposition and sufficiently high to prevent any dangerous phase separation.

Table 2-6. List of currently assigned self-reactive substances in packages

Note. — *Self-reactive substances to be transported must fulfill the classification and the control and emergency temperatures (derived from the SADT) as listed.* ~~The classification given in this table is based on the technically pure substance (except where a concentration of less than 100 per cent is specified). For other concentrations, the substances may be classified differently following the procedures in 2.4.2.3.3 and 2.4.2.3.4 of the *UN Recommendations on the Transport of Dangerous Goods*.~~

. . .

4.5 Classification of organometallic substances

Depending on their properties, organometallic substances may be classified in divisions 4.2 or 4.3, as appropriate, in accordance with the flowchart scheme given in Figure 2.4.2 of the *UN Recommendations on the Transport of Dangerous Goods*.

— — — — — — — —

CHAPTER 5 — OXIDIZING SUBSTANCES; ORGANIC PEROXIDES

Table 2-7. List of currently assigned organic peroxides in packages. Peroxides to be transported must fulfil the classification and the control and emergency temperatures (derived from that 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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
~~Acetyl benzoyl peroxide~~	~~#45~~	~~$55~~						~~3105~~	
tert-Amyl peroxyacetate	#62	$38						~~3.1e+07~~	
tert-Amylperoxy isopropyl carbonate	#77	$23						3103	
tert-Butyl cumyl peroxide	>42-100							~~3.1e+07~~	
tert-Butyl cumyl peroxide	~~#42~~ #52			~~$58~~ $ 48				~~3.1e+07~~	
~~n-Butyl-4,4-di-(tert-butylperoxy) valerate~~	~~#52~~			~~$48~~				~~3106~~	
n-Butyl-4,4-di-(tert-butylperoxy) valerate	~~#42~~ #52			~~$58~~ $48				3108	
~~tert-Butyl monoperoxyphthalate~~	~~#100~~							~~3102~~	~~3~~
tert-Butyl peroxyacetate	#32	~~$68~~	$68					3109	
~~tert-Butyl peroxyacetate~~	~~#22~~		~~$78~~					~~3109~~	~~25)~~
tert-Butyl peroxybenzoate	>77-100	~~<22~~						3103	
~~tert-Butyl peroxydiethylacetate + tert-Butyl peroxybenzoate~~	~~#33 + #33~~	~~$33~~						~~3105~~	
tert-Butyl peroxyisobutyrate	>52-77		~~>23~~ $23			+15	+20	3111	3
tert-Butyl peroxyisobutyrate	#52		~~>48~~ $48			+15	+20	3115	
tert-Butyl peroxyneodecanoate	#52 as a stable dispersion in water					0	+10	~~3.1e+07~~	
tert-Butyl peroxyneoheptanoate	#42 as a stable dispersion in water					0	10	3117	
~~3-tert-Butylperoxy-3-phenylphthalide~~	~~#100~~							~~3106~~	

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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
tert-Butyl peroxy-3,5,5- trimethyl-hexanoate	#32	~~$68~~	$68					3109	
~~Dibenzoyl peroxide~~	~~>36-42~~	~~$58~~						~~3107~~	
~~Dibenzyl peroxydicarbonate~~	~~#87~~				~~$13~~	~~+25~~	~~+30~~	~~3112~~	~~3~~
Di-tert-butyl peroxide	~~>32-100~~ >52-100							3107	
1,6-Di-(tert-butylperoxycarbonyloxy) hexane	#72	$28						3103	
1,1-Di-(tert-butylperoxy)cyclohexane	#27	~~$36~~ $25						3107	21
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	#77		$23					~~3.1e+07~~	
1,1-Di-(tert-butylperoxy)-3,3,5-trimethylcyclohexane	#57			$43				~~3.1e+07~~	
Dicumyl peroxide	~~>42-100~~ >52-100			#57				3110	
Dicyclohexyl peroxydicarbonate	>91-100					~~+5~~ +10	~~+10~~ +15	3112	3
Dicyclohexyl peroxydicarbonate	#91				$9	~~+5~~ +10	~~25~~	3114	
Dicyclohexyl peroxydicarbonate	#42 as a stable dispersion in water					15	20	3119	
Di-(2-ethylhexyl)peroxydicarbonate	~~#42~~ #52 as a stable disper-sion in water (frozen)					–15	–5	~~3.1e+07~~	
~~Diethyl peroxydicarbonate~~	~~#27~~		~~$73~~			~~–10~~	~~0~~	~~3115~~	
~~Diisotridecyl peroxydicarbonate~~	~~#100~~					~~–10~~	~~0~~	~~3115~~	
~~2,5-Dimethyl-2,5-di-(tert-butylperoxy)hexane~~	~~#52~~			~~$48~~				~~3106~~	
~~Diperoxy azelaic acid~~	~~#27~~			~~$73~~		~~+35~~	~~+40~~	~~3116~~	
~~Diperoxy dodecane diacid~~	~~>13-42~~			~~$58~~		~~+40~~	~~+45~~	~~3116~~	

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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
~~Diperoxy dodecane diacid~~	~~#13~~			~~$87~~				~~Exempt~~	~~29~~
~~Distearyl peroxydicarbonate~~	~~#87~~			~~$13~~				~~3106~~	
~~Di-(3,5,5-trimethyl-1,2-dioxolanyl-3)peroxide~~	~~#52 as a paste~~					~~+30~~	~~+35~~	~~3116~~	~~20~~
1-(2-Ethylhexanoylperoxy)-1,3-dimethylbutyl peroxypivalate	#52	$45	$10			-20	-10	3115	
~~3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane~~	~~>52-100~~							~~3102~~	~~3~~
~~3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane~~	~~#52~~	~~$48~~						~~3105~~	
~~3,3,6,6,9,9-Hexamethyl-1,2,4,5-tetraoxacyclononane~~	~~#52~~			~~$48~~				~~3106~~	
Methyl ethyl ketone peroxide(s)	~~#52~~ see remark 8)	$48						3101	3813
Methyl ethyl ketone peroxide(s)	~~#45~~ see remark 9)	$55						3105	9
Methyl ethyl ketone peroxide(s)	~~#40~~ see remark 10)	$60						3107	10
~~Methyl ethyl ketone peroxide(s)~~	~~#37~~	~~$55~~			~~$8~~			~~3105~~	~~9~~
~~Peroxyacetic acid, type F, stabilized~~	~~#41~~					~~30~~	~~35~~	~~3119~~	~~1330~~
Peroxylauric acid	#100					35	40	3118	
Pinanyl hydroperoxide	~~56-100~~ >56-100							3105	13
Pinanyl hydroperoxide	~~<56~~ #56	~~>44~~ $44						3109	
Polyether poly-tert-butylperoxycarbonate	#52		$23					3107	
~~Tetrahydronaphthyl hydroperoxide~~	~~#100~~							~~3106~~	
1,1,3,3-Tetramethylbutylperoxy-2 ethylhexanoate	#100					~~20~~ 15	~~25~~ 20	3115	
~~1,1,3,3-Tetramethylbutyl peroxyphenoxyacetate~~	~~#37~~		~~$63~~			~~-10~~	~~0~~	~~3115~~	

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 (EC)*	*Emergency tempera-ture (EC)*	*UN generic entry*	*Notes*
1,1,3,3-Tetramethylbutyl peroxypivalate	#77	$23				0	10	3315	

Notes:

1. Diluent type B may always be replaced by diluent type A. Boiling point diluent type B should be at least 60 EC higher than the SADT of the organic peroxide.
2. Available oxygen #4.7 per cent.
3. "EXPLOSIVE" subsidiary risk label required (see Figure 5-2).
4. Diluent may be replaced by Di-tert-butyl peroxide.
5. Available oxygen #9 per cent.
6. With #9 per cent hydrogen peroxide; available oxygen #10per cent.
7. Only non-metallic packagings allowed.
8. Available oxygen >10 per cent and #10.7 per cent, with or without water.
9. Available oxygen #10 per cent, with or without water.
10. Available oxygen #8.2 per cent, with or without water.
11. See 5.3.2.5.1.
13. "CORROSIVE" subsidiary risk label required (see Figure 5-20).
14. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
15. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
16. Peroxyacetic acid formulations which fulfil the criteria of 5.3.2.5.
17. Addition of water to this organic peroxide will decrease its thermal stability.
18. No "CORROSIVE" subsidiary risk label required for concentrations below 80 per cent.
19. Mixtures with hydrogen peroxide, water and acid(s).
20. With diluent type A, with or without water.
21. ~~With $36 per cent, by mass, Ethylbenzene in addition to diluent type A.~~ With $25 per cent diluent type A by mass, and in addition ethylbenzene.
22. ~~With $19 per cent, by mass, Methyl isobutyl ketone in addition to diluent type A.~~ With $19 per cent diluent type A by mass, and in addition methyl isobutyl ketone.
23. With <6 per cent di-tert-butyl peroxide.
24. With #8 per cent 1-isopropylhydroperoxy-4-isopropylhydroxybenzene.
25. Diluent type B with boiling point >110EC.
26. With <0.5 per cent hydroperoxides content.
27. For concentrations more than 56 per cent, "CORROSIVE" subsidiary risk label required (see Figure 5-20).
28. Available active oxygen #7.6 per cent in diluent type A having a 95 per cent boil-off point in the range of 220-260EC.
29. Not subject to the requirements of these Instructions for Division 5.2.
30. ~~Formulations derived from distillation of peroxyacetic acid originating from peroxyacetic acid in concentration of not more than 41per cent with water, total active oxygen (Peroxyacetic acid + H_2O_2) #9.5 per cent, which fulfils the criteria of 2.5.3.3 f) of the *UN Recommendations on the Transport of Dangerous Goods*~~.

— — — — — — — —

CHAPTER 6 – TOXIC AND INFECTIOUS SUBSTANCES

INTRODUCTORY NOTES

~~*Note 1. – Genetically modified micro-organisms and organisms which do not meet the definition of an infectious substance should be considered for classification in class 9 and assignment to UN 3245.*~~

Note ~~2~~. – Toxins from plant, animal or bacterial sources which do not contain any infectious substances or toxins that are not contained in substances which are infectious substances should be considered for classification in division 6.1 and assignment to UN 3172.

6.1 DEFINITIONS

Class 6 is divided into two divisions as follows:

a) Division 6.1 – Toxic substances.

Substances liable either to cause death or injury or to harm human health if swallowed, if inhaled or by skin contact.

Note. – In these Instructions 'poisonous' has the same meaning as 'toxic'.

b) Division 6.2 — Infectious substances.

Substances know to contain, or reasonably expected to contain, pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsia, parasites, fungi) ~~or recombinant micro-organisms (hybrid or mutant), that are known or reasonably expected to cause infectious disease in animals or humans~~ and other agents such as prions, which can cause disease in humans or animals.

6.2 TOXIC SUBSTANCES

6.2.1 Definitions

For the purposes of these Instructions:

6.2.1.1 *LD_{50} (median lethal dose) for acute oral toxicity* is ~~that~~ the statistically derived single dose of ~~the~~ a substance ~~administered which is most likely~~ that can be expected to cause death within 14 days in ~~half of both male and female~~ 50 per cent of young adult albino rats when administered by the oral route. The LD_{50} value is expressed in terms of mass of test substance per mass of test animal (mg/kg). ~~The number of animals tested must be sufficient to give a statistically significant result and be in conformity with good pharmacological practices. The result is expressed in mg/kg body mass.~~

6.2.1.2 *LD_{50} for acute dermal toxicity* is that dose of the substance which, administered by continuous contact for 24 hours with the bare skin of albino rabbits, is most likely to cause death within 14 days in half of the animals tested. The number of animals tested must be sufficient to give a statistically significant result and be in conformity with good pharmacological practices. The result is expressed in mg/kg body mass.

6.2.13 *LD_{50} for acute toxicity on inhalation* is that concentration of vapour, mist or dust which, administered by continuous inhalation for one hour to both male and female young adult albino rats, is most likely to cause death within 14 days in half of the animals tested. A solid substance should be tested if at least 10 per cent (by mass) of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 Fm or less. A liquid substance should be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90 per cent (by mass) of a specimen prepared for inhalation toxicity should be in the respirable range as defined above. The result is expressed in mg/L of air for dusts and mists or in mL/m^3 of air (parts per million) for vapours.

. . .

Editorial Note.— Delete 6.3 and replace with the following new text

6.3 Division 6.2 - Infectious substances

6.3.1 *Definitions*

For the purposes of these Instructions:

6.3.1.1 *Infectious substances* are substances which are known or are reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals.

6.3.1.2 *Biological products* are those products derived from living organisms which are manufactured and distributed in accordance with the requirements of appropriate national authorities, which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or investigational purposes related thereto. They include, but are not limited to, finished or unfinished products such as vaccines.

6.3.1.3 *Cultures* (laboratory stocks) are the result of a process by which pathogens are amplified or propagated in order to generate high concentrations, thereby increasing the risk of infection when exposure to them occurs. This definition refers to cultures prepared for the intentional generation of pathogens and does not include cultures intended for diagnostic or clinical purposes.

6.3.1.4 *Medical or clinical wastes* are wastes derived from the medical treatment of animals or humans or from bio-research.

6.3.2 *Classification of infectious substances*

6.3.21 Infectious substances must be classified in Division 6.2 and assigned to UN 2814, UN 2900 or UN 3373 as appropriate..

6.3.2.2 Infectious substances are divided into the following categories.

6.3.2.2.1 Category A: An infectious substance which is transported in a form that, when exposure to it occurs is capable of causing permanent disability, life-threatening or fatal disease to humans or animals. Indicative examples of substances that meet these criteria are given in the table in this paragraph.

Note. — An exposure occurs when an infectious substance is released outside of the protective packaging resulting in physical contact with humans or animals.

(a) Infectious substances meeting these criteria which cause disease in humans or both in humans and animals must be assigned to UN 2814. Infectious substances which cause disease only in animals must be assigned to UN 2900.

(b) Assignments to UN 2814 or UN 2900 must be based on the known medical history and symptoms of the source human or animal, endemic local conditions, or professional judgement concerning individual circumstances of the source human or animal.

Note 1. — The proper shipping name for UN 2814 is **Infectious substance, affecting humans.** *The proper shipping name for UN 2900 is* **Infectious substance, affecting animals** *only.*

Note 2. — The following table in not exhaustive. Infectious substances, including new or emerging pathogens, which do not appear in the table but which meet the same criteria must be assigned to Category A. In addition, if there is doubt as to whether or not a substance meets the criteria it must be included in Category A.

Note 3. — In the following table, the micro-organisms written in italics are bacteria, mycoplasma, rickettsia or fungi.

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (6.3.2.2.1 (a))	
UN Number and Proper Shipping Name	**Micro-organism**
UN 2814 Infectious substances affecting humans	*Bacillus anthracis (cultures only)* *Brucella abortus (cultures only)* *Brucella melitensis (cultures only)* *Brucella suis (cultures only)* *Burkholderia mallei - Pseudomonas mallei* – Glanders *(cultures only)* *Burkholderia pseudomallei – Pseudomonas pseudomallei (cultures only)*

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (6.3.2.2.1 (a))	
UN Number and Proper Shipping Name	**Micro-organism**
UN 2814 Infectious substances affecting humans *(cont'd)*	*Chlamydia psittaci* - avian strains (cultures only) *Clostridium botulinum (cultures only)* *Coccidioides immitis (cultures only)* *Coxiella burnetii (cultures only)* Crimean-Congo hemorrhagic fever virus Dengue virus (cultures only) Eastern equine encephalitis virus (cultures only) *Escherichia coli*, verotoxigenic (cultures only) Ebola virus Flexal virus *Francisella tularensis (cultures only)* Guanarito virus Hantaan virus Hantaviruses causing hantavirus pulmonary syndrome Hendra virus Hepatitis B virus (cultures only) Herpes B virus (cultures only) Human immunodeficiency virus (cultures only) Highly pathogenic avian influenza virus (cultures only) Japanese Encephalitis virus (cultures only) Junin virus Kyasanur Forest disease virus Lassa virus Machupo virus Marburg virus Monkeypox virus

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (6.3.2.2.1 (a))	
UN Number and Proper Shipping Name	**Micro-organism**
	Mycobacterium tuberculosis (cultures only) Nipah virus Omsk hemorrhagic fever virus *Poliovirus (cultures only*) Rabies virus *Rickettsia prowazekii (cultures only)* *Rickettsia rickettsii* (cultures only) Rift Valley fever virus *Russian spring-summer encephalitis virus (cultures only*) Sabia virus *Shigella dysenteriae type 1 (cultures only)* *Tick-borne encephalitis virus (cultures only*) Variola virus Venezuelan equine encephalitis virus *West Nile virus (cultures only*) *Yellow fever virus (cultures only*) *Yersinia pestis* (cultures only)
UN 2900 Infectious substances affecting animals only	African horse sickness virus African swine fever virus Avian paramyxovirus Type 1 - Newcastle disease virus Bluetongue virus Classical swine fever virus Foot and mouth disease virus Lumpy skin disease virus *Mycoplasma mycoides* - Contagious bovine pleuropneumonia Peste des petits ruminants virus Rinderpest virus Sheep-pox virus Goatpox virus Swine vesicular disease virus Vesicular stomatitis virus

6.3.2.2.2 Category B: An infectious substance which does not meet the criteria for inclusion in Category A. Infectious substances in Category B must be assigned to UN 3373 except that cultures as defined in 6.3.1.3 must be assigned to UN 2814 or UN 2900 as appropriate.

Note. — The proper shipping name of UN 3373 is ***Diagnostic specimens*** *or* ***Clinical specimens***

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

6.3.2.4 Blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation are not subject to these Instructions.

6.3.2.5 Substances for which there is a low probability that infectious substances are present, or where the concentration is at a level naturally encountered, are not subject to these Instructions. Examples are: foodstuffs, water samples, living persons and substances which have been treated so that the pathogens have been neutralized or deactivated so that they no longer pose a health risk.

6.3.2.6 A live animal which has been intentionally infected and is known or suspected to contain an infectious substance must not be transported by air unless the infectious substance contained cannot be consigned by any other means. Infected animals may only be transported under terms and conditions approved by the appropriate national authority.

6.3.3 Biological products

6.3.3.1 For the purposes of these Instructions, biological products are divided into the following groups:

(a) Those which are manufactured and packaged in accordance with the requirements of appropriate national authorities and transported for the purposes of final packaging or distribution, and use for personal health care by medical professionals or individuals. Substances in this group are not subject to these Instructions.

(b) Those which do not fall under paragraph (a) and are known or reasonably believed to contain infectious substances and which meet the criteria for inclusion in Category A or Category B. Substances in this group must be assigned to UN 2814, UN 2900 or UN 3373, as appropriate.

Note. — Some licensed biological products may present a biohazard only in certain parts of the world. In that case, appropriate national authorities may require these biological products to be in compliance with local requirements for infectious substances or may impose other restrictions.

6.3.4 *Genetically modified micro-organisms and organisms*

6.3.4.1 Genetically modified micro-organisms not meeting the definition of infectious substances must be classified according to Chapter 9.

6.3.5 *Medical or clinical wastes*

6.3.5.1 Medical or clinical wastes containing Category A infectious substances or containing Category B infectious substances in cultures must be assigned to UN 2814 or UN 2900 as appropriate. Medical or clinical wastes containing infectious substances in Catogory B, other than cultures, must be assigned to UN 3291.

6.3.5.2 Medical or clinical wastes which are reasonably believed to have a low probability of containing infectious substances must be assigned to UN 3291.

Note. — The proper shipping name for UN 3291 is ***Clinical waste, unspecified, n.o.s.*** *or* ***(Bio) Medical waste, n.o.s.*** *or* ***Regulated medical waste, n.o.s.***

6.3.5.3 Decontaminated medical or clinical wastes which previously contained infectious substances are not subject to these Instructions unless they meet the criteria for inclusion in another class.

— — — — — — — —

CHAPTER 7 — CLASS 7 — RADIOACTIVE MATERIAL

7.1 DEFINITION OF CLASS 7

7.1.1 Radioactive material means any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed the values specified in 7.7.2.1 to 7.7.2.6.

7.1.2 The following radioactive materials are not included in Class 7 for the purposes of these Instructions:

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

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

c) natural material and ores containing naturally occurring radionuclides which are either in their natural state, or have only been processed for purposes other than for extraction of the radionuclides, and not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in 7.7.2.

d) Non-radioactive solid objects with radioactive substances present on any surfaces in quantities not in excess of the limit ~~defined~~ specified in the definition of contamination in 7.2.

. . .

7.2 DEFINITION

Package in the case of radioactive material. The packaging with its radioactive contents as presented for transport. The types of packages covered by these Instructions, which are subject to the activity limits and material restrictions of 7.7 and meet the corresponding requirements, are:

a) Excepted package;

b) Industrial package Type 1 (Type IP-1 package);

c) Industrial package Type 2 (Type IP-2 package);

d) Industrial package Type 3 (Type IP-3 package);

e) Type A package;

f) Type B(U) package;

g) Type B(M) package;

h) Type C package.

Packages containing fissile material or uranium hexafluoride are subject to additional requirements.

Note. — For packages for other dangerous goods, see the definition under 1;3.1.1.

. . .

Table 2-10. Multiplication factor for ~~large dimension loads~~ freight containers

*Size of load**	*Multiplication factor*
size of load # 1 m^2 1 m^2 < size of load # 5 m^2 5 m^2 < size of load # 20 m^2 20 m^2 < size of load	1 2 3 10
***** Largest cross-sectional area of the load being measured.	

. . .

7.6.2 Determination of criticality safety index (CSI)

7.6.2.1 The criticality safety index (CSI) for packages containing fissile material must be obtained by dividing the number 50 by the smaller of the two values of N derived in 6;7.10.11 and 6;7.10.12 (i.e. CSI = 50/N). The value of the criticality safety index may be zero, provided that an unlimited number of packages is subcritical (i.e. N is effectively equal to infinity in both cases).

7.6.2.2 The criticality safety index for each ~~consignment~~ overpack or freight container must be determined as the sum of the CSIs of all the packages contained ~~in that consignment~~. The same procedure must be followed for determining the total sum of CSIs in a consignment or abroad an aircraft.

. . .

Table 2-12. Basic radionuclides values for individual radionuclides

Radionuclide (atomic number)	*A_1 (TBq)*	*A_2 (TBq)*	*Activity concentration for exempt material (Bq/g)*	*Activity limit for an exempt consignment (Bq)*
Cf-252	~~5×10^{-2}~~ 1×10^{-1}	3×10^{-3}	1×10^{1}	1×10^{4}

7.8 LIMITS ON TRANSPORT INDEX, CRITICALITY SAFETY INDEX, RADIATION LEVELS FOR PACKAGES AND OVERPACKS

7.8.1 Except for consignments under exclusive use, the transport index of any package or overpack must not exceed 10, nor must the criticality safety index of any package or overpack exceed 50.

7.8.2 Except for packages or overpacks transported under exclusive use and special arrangement under the conditions specified in 7;2.9.5.3, the maximum radiation level at any point on any external surface of a package or overpack must not exceed 2 mSv/h.

7.8.3 The maximum radiation level at any point on any external surface of a package or overpack under exclusive use must not exceed 10 mSv/h.

. . .

7.9 REQUIREMENTS AND CONTROLS FOR TRANSPORT OF EXCEPTED PACKAGES

7.9.1 Excepted packages which may contain radioactive material in limited quantities, instruments, manufactured articles as specified in 7.7.1.2 and empty packagings as specified in 7.9.6, may be transported under the following conditions:

a) the applicable requirements specified in 2; Introductory Chapter, 4.2, 2;7.9.2, and, as applicable, 2;7.9.3 to 2;7.9.6, 4;9.1.2, ~~5;2.4.1.1~~, 5;2.4.2, 5;2.4.5 a) and e), 5;3.2.11 e), 5;4.5, 7;3.2.2 and 7;4.4;

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

c) if the excepted package contains fissile material, one of the fissile exceptions provided by 6;7.10.2 must apply and the requirement of 6;7.6.2 must be met; and

d) the requirements in 1;2.3, if transported by post.

7.9.2 The radiation level at any point on the external surface of an excepted package must not exceed 5 µSv/h.

Table 2-14. Categories of packages and overpacks

Conditions		
Transport index	*Maximum radiation level at any point on external surface*	*Category*
0*	Not more than 0.005 mSv/h	I-WHITE
More than 0 but not more than 1*	More than 0.005 mSv/h but not more than 0.5 mSv/h	II-YELLOW
More than 1 but not more than 10	More than 0.5 mSv/h but not more than 2 mSv/h	III-YELLOW
More than 10	More than 2 mSv/h but not more than 10 mSv/h	III-YELLOW**
* If the measured transport index is not greater than 0.05, the value quoted may be zero in accordance with 7.6.1.1 c). ** Must be transported under exclusive use and special arrangement.		

7.9.3 Radioactive material which is enclosed in or is included as a component part of an instrument or other manufactured article, with activity not exceeding the item and package limits specified in columns 2 and 3 respectively of Table 2-11, may be transported in an excepted package provided that:

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

b) each instrument or article ~~(except radioluminescent time-pieces or devices)~~ bears the marking "RADIOACTIVE" except

i) radioluminescent time-pieces or devices;

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

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

~~7.9.7 Excepted packages must be marked to indicate that the shipper has determined that the packaging meets the applicable air transport requirements. The marking must be as specified in 5;2.4.12.~~

— — — — — — — —

CHAPTER 8 — CLASS 8 — CORROSIVES

. . .

8.2 ASSIGNMENT OF PACKING GROUPS

. . .

a) *Packing Group I* is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period of up to 60 minutes starting after an exposure time of 3 minutes or less.

b) *Packing Group II* is assigned to substances that cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 3 minutes but not more than 60 minutes.

c) *Packing Group III* is assigned to substances that:

i) cause full thickness destruction of intact skin tissue within an observation period of up to 14 days starting after an exposure time of more than 60 minutes but not more than 4 hours;

ii) are judged not to cause full thickness destruction of intact skin tissue but which exhibit a corrosion rate on steel or aluminium surfaces exceeding 6.25 mm a year at a test temperature of 55EC. For the purposes of testing steel, type ~~P235 (ISO 9328 (II): 1991)~~ S235JR+CR (1.0037 resp. St 37-2), S275J2G3+CR (1.0144 resp. St 44-3), ISO 3574, Unified Numbering System (UNS) G10200 or SAE 1020, ~~or a similar type,~~ and for testing aluminium, non-clad types 7075-T6 or AZ5GU-T6, must be used. An acceptable test is prescribed in ~~ASTM G31-72 (Reapproved 1990)~~ the UN *Manual of Tests and Criteria*, Part III, Section 37.

— — — — — — — —

CHAPTER 9 – CLASS 9 – MISCELLANEOUS DANGEROUS SUBSTANCES AND ARTICLES

9.1 DEFINITION

9.1.1 *Class 9 substances and articles (miscellaneous dangerous substances and articles)* are substances and articles which, during air transport, present a danger not covered by other classes. ~~This class includes:~~

9.1.2 *Genetically modified micro-organisms (GMMOs) and genetically modified organisms (GMOs)* are micro-organisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally.

9.2 Assignment to Class 9

9.2.1 Class 9 includes, inter alia:

a) environmentally hazardous substances; liquid or solid substances pollutant to the aquatic environment and solutions and mixtures of such substances (including preparations and wastes). See Part 3, Chapter 3, special provision A97.

b) elevated temperature substances (i.e. substances that are transported or offered for transport ~~in a liquid state~~ at temperatures equal to or exceeding 100° C in a liquid state ~~and below their flash point~~, or ~~in a solid state~~ at temperatures equal ~~to~~ or exceeding 240° C in a solid state (these substances may only be carried under 1;1.1).

c) GMMOs or GMOs which do not meet the definition of infectious substances (see 6.3) but which are capable of altering animals, plants or microbiological substances in a way not normally the result of natural reproduction. They must be assigned to UN 3245.

GMMOs or GMOs are not subject to these Instructions when authorized for use by the appropriate national authorities of the States of origin, transit and destination.

d) Magnetized material: Any material which, when packed for air transport, has a magnetic field strength of 0.159 A/m or more at a distance of 2.1 m from any point on the surface of the assembled package (see also Packing Instruction 902).

Note. — Masses of ferro-magnetic metals such as automobiles, automobile parts, metal fencing, piping and metal construction material, even if not meeting the definition of magnetized materials may be subject to the operator's special stowage requirements since they may affect aircraft instruments, particularly the compasses. Additionally, packages or items of material which individually do not meet the definition of magnetized materials but cumulatively may do so, may also be subject to the operator's special stowage requirements.

e) Aviation regulated solid or liquid: Any material which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, extreme

annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

— — — — — — — —

PART 3 — DANGEROUS GOODS LIST AND LIMITED QUANTITIES EXCEPTIONS

CHAPTER 1 — GENERAL

. . .

1.2 PROPER SHIPPING NAME

. . .

1.2.3 ~~Unless it is already included in boldface characters in the name indicated in the Dangerous Goods List, the qualifying word "liquid" or "solid", as appropriate, must be added as part of the proper shipping name when a substance specifically listed by name may, due to the differing physical states of the various isomers of the substance, be either a liquid or a solid.~~ Many substances have an entry for both the liquid and solid state (see definitions for liquid and solid in 1;3.1.1), or for the solid and solution. These are allocated separate UN numbers which are not necessarily adjacent to each other. Details are provided in the alphabetical index (see Attachment 1, Chapter 1), e.g.:

1665 **Nitroxylenes, liquid**
3447 **Nitroxylenes, solid**

. . .

1.2.6 Hydrates may be ~~included~~ transported under the proper shipping name for the anhydrous substance.

1.2.7 Generic or "not otherwise specified" (n.o.s.) names

1.2.7.1 Generic and " not otherwise specified" proper shipping names, indicated by the inclusion of an asterisk in Column 1 of the Dangerous Goods List must be supplemented with ~~their~~ the technical or chemical group names unless a national law or international convention prohibits its disclosure if it is a controlled substance. For explosives of Class 1, the dangerous goods description may be supplemented by additional descriptive text to indicate commercial or military names. Technical and chemical group names must be entered in brackets immediately following the proper shipping name. An appropriate modifier, such as "contains" or "containing" or other qualifying words such as "mixture", "solution", etc. and the percentage of the technical constituent may be used. For example: "UN 1993 **Flammable liquid, n.o.s.** (contains xylene and benzene), 3, PG II.

. . .

1.2.7.1.2 When a mixture of dangerous goods is described by one of the "n.o.s." or "generic" entries where an asterisk is indicated in column 1 in the Dangerous Goods List, not more than the two constituents which most predominantly contribute to the hazard or hazards of a mixture need to be shown, excluding controlled substances when their disclosure is prohibited by national law or international convention. If a package containing a mixture is labelled with any subsidiary risk label, one of the two technical names as shown in parentheses must be the name of the constituent which compels the use of the subsidiary risk label.

Examples illustrating the selection of the proper shipping name supplemented with the technical name of the dangerous goods for such n.o.s. entries are:

UN 3394 **Organometallic substance, liquid, pyrophoric, water-reactive** ~~UN 2003 Metal Alkyl, water-reactive, n.o.s~~ (Trimethylgallium).

UN 2902 **Pesticide, liquid, toxic, n.o.s.** (Drazoxolon)**.**

Note. — As an aid to choosing the most appropriate n.o.s. or generic name, all the n.o.s. entries and the main generic entries of Table 3-1 are listed in Attachment 1, Chapter 2.

— — — — — — — —

CHAPTER 2 — ARRANGEMENT OF THE DANGEROUS GOODS LIST (TABLE 3-1)

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

2.1.1 The Dangerous Goods List (Table 3-1) is divided into 12 columns as follows:

Column 1 'Name' — this column contains the alphabetically arranged list of dangerous goods, identified by their proper shipping names in boldface characters (see 1.2). Also included, in lightface type, are other names by which certain articles and substances may be known; in such cases a cross-reference to the proper shipping name is given. An explanation of some of the terms used appears in Attachment 2.

Entries in this column have been arranged in alphabetical order; where names comprise more than one word, they have been alphabetized as if they were a single word. In deciding the correct order, numbers and the terms n.o.s., alpha-, beta-, meta-, omega-, sec-, tert-, a-, b-, m-, N-, n-, O-, o- and p-, have been ignored. Similarly, the word 'see' and any words following it have been ignored.

Unless otherwise indicated for an entry in the dangerous goods list, the word "**solution**" in a proper shipping name means one or more named dangerous goods dissolved in a liquid that is not otherwise subject to these Instructions.

~~*Note. - Minor discrepancies, such as the omission of dots and commas in the proper shipping name appearing on the transport documents or on package markings are not considered as errors if they do not compromise safety and should not be considered as reason for rejecting a consignment.*~~

Editorial Note.— Transfer Note to 7;1.1.2

Column 2 "UN No." — this column contains the serial number assigned to the article or substance under the United Nations classification system. Some entries in the list have not been assigned such a number and for these, a temporary identification number (ID) in the 8000 series has been allocated and is indicated where appropriate. Numbers in the 8000 series must be identified with the "ID" prefix instead of when "UN" is indicated for marking and documentation in these Technical Instructions. When the word "Forbidden" appears across this column and column 3, it means that the dangerous goods covered by that particular entry meet the description of dangerous goods forbidden on aircraft under any circumstances, as provided in 1;2.1. It must be noted, however, that all dangerous goods meeting this description have not been included in the Dangerous Goods List.

Editorial Note.— See Attachment to this Appendix for Amendments to Table 3-1

— — — — — — — —

CHAPTER 3 — SPECIAL PROVISIONS

Table 3-2 lists the special provisions referred to in column 7 of Table 3-1 and the information contained in them is additional to that shown for the relevant entry.

. . .

A1 This commodity may be transported on passenger aircraft only with the prior approval of the appropriate authority of the State of Origin under the written conditions established by that authority. The conditions must include the quantity limitations and packing requirements and these must comply with S-3;1.2.2 of the Supplement. A copy of the document of approval, showing the quantity limitations and packing requirements, must accompany the consignment. The commodity may be carried on cargo aircraft in accordance with columns 11 and 12 of Table 3-1. When States, other than the State of Origin, have notified ICAO that they require prior approval of shipments made under this Special provision, approval must also be obtained from these States, as appropriate.

. . .

A2 This commodity may be transported on passenger aircraft and on cargo aircraft, only with the prior approval of the appropriate authority of the State of Origin under the written conditions established by the authority.

~~For passenger aircraft,~~ ~~w~~Where States, other than the State of origin, have notified ICAO that they require prior approval of shipments made under this Special Provision, approval must also be obtained from the States of transit, overflight and destination and of the State of the Operator, as appropriate.

In each case the conditions must include the quantity limitations and packing requirements and these must comply with S-3;1.2.3 of the Supplement. A copy of the document(s) of approval, showing the quantity limitations and the packing and labelling requirements, must accompany the consignment.

. . .

A21 This entry only applies to vehicles and equipment which are powered by wet batteries, sodium batteries or lithium batteries and which are transported with these batteries installed. Examples of such vehicles and equipment are electrically-powered cars, lawn mowers, wheelchairs and other mobility aids. Vehicles that also contain an internal combustion engine must be consigned under the entry Vehicle (flammable gas powered) or Vehicle (flammable liquid powered), as appropriate. Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries or lithium 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.

. . .

A47 Genetically modified micro-organisms and genetically modified organisms, which ~~are not~~ meet the definition of an infectious substance~~s~~ and the criteria for inclusion in Division 6.2 in accordance with 2;6 must be transported as UN 2814, UN 2900 or UN 3373, as appropriate. ~~but which are capable of altering animals, plants or microbiological substances in a way that is not normally the result of natural reproduction, must be transported as UN 3245. Genetically modified micro-organisms which are infectious must be transported as UN 2814 or UN 2900.~~

. . .

A51 Irrespective of the limit specified in column 10 of Table 3-1, aircraft batteries up to a limit of 100 kg gross mass per package may be transported. Transport in accordance with this special provision must be noted on the dangerous goods transport document.

. . .

A60 This entry only applies to the technically pure substance or to formulations derived from it having an SADT higher than 75ºC and therefore does not apply to formulations which are self-reactive substances. (For self-reactive substances, see Part 2;4.2.3. Table 2-6). Homogeneous mixtures containing not more than 35 per cent by mass of azocarbonamide and at least 65 per cent of inert substance are not subject to these Instructions unless criteria of other classes or divisions are met.

...

A78 Radioactive material with a subsidiary risk must:

a) be labelled with subsidiary risk labels corresponding to each subsidiary risk exhibited by the material in accordance with the relevant provisions of Part 5,3.2; corresponding placards must be affixed to transport units in accordance with the relevant provisions of 5;3.5;

b) be allocated to packing groups I, II or III, as and if appropriate, by application of the grouping criteria provided in Part 2 corresponding to the nature of the predominant subsidiary risk.

. . .

A81 ~~The quantity limit shown in column 10 does not apply to body fluids known to contain or suspected of containing infectious substances provided they are not in risk group 4, when in primary receptacles not exceeding 1000 mL, and in outer packagings not exceeding 4 L.~~ The quantity limits shown in columns 10 and 12 do not apply to body parts, organs or whole bodies ~~known to contain or suspected of containing infectious substances. These materials must be packed in accordance with Packing Instruction 602 so as to present no hazard to persons or animals during transport. This special provision does not apply to infectious substances carried in air mail.~~

. . .

A88 Prototype lithium batteries and cells that are packed with not more than 24 cells or 12 batteries per packaging that have not been tested to the requirements in subsection 38.3 of the *UN Manual of Tests and Criteria* may be transported aboard cargo aircraft if approved by the appropriate authority of the State of Origin and the following requirements are met:

a) the cells and batteries must be transported in an outer packaging that is a metal, plastic or plywood drum or a metal, plastic or wooden box and that meets the criteria for Packing Group I packagings; and

b) each cell and battery must be individually packed in an inner packaging inside an outer packaging and surrounded by cushioning material that is non-combustible, and non-conductive. Cells and batteries must be protected against short circuiting.

. . .

A97 The designation of this substance is to be decided by the appropriate national authority. Substances classified as UN 3077 or UN 3082 by the regulations of other modes of transport may also be transported by air under these entries. This designation may be used for substances and mixtures which are dangerous to the aquatic environment or which are marine pollutants that do not meet the classification criteria of any other class or another substance within Class 9. This designation may also be used for wastes not otherwise subject to these Instructions but which are covered under the Basle Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and for substances designated to be environmentally hazardous substances by the appropriate authority of the State of origin, transit or destination.

Note. — If any document has been issued in relation to such designation, it is not required to accompany a consignment.

. . .

A100 Gasoline, motor spirit and petrol for use in spark-ignition engines (e.g. in automobiles, stationary engines and other engines) must be assigned to this entry regardless of variations in volatility".

. . .

A109 This commodity may be transported on cargo aircraft only with the prior approval of the appropriate authority of the State of Origin under the written conditions established by that authority. The conditions must include the quantity limitations and packing requirements and these must comply with S-3;1.2.4 of the Supplement. A copy of the document of approval, showing the quantity limitations and packing requirements, must accompany the consignment.

Where States, other than the State of origin, have notified ICAO that they require prior approval of shipments made under this special provision, approval must also be obtained from these States, as appropriate.

. . .

A111 Oxygen generators, chemical, that have passed their expiration date, are unserviceable, or that have been used are forbidden for transport.

A112 Consumer commodities may only include substances of Class 2 (non-toxic aerosols only), Class 3, Packing Group II or III, Division 6.1 (Packing Group III only) and UN 3175, provided such substances do not have a subsidiary risk. Dangerous goods that are forbidden for transport aboard passenger aircraft must not be transported as consumer commodities.

. . .

A 132 Articles containing smoke - producing substance(s) corrosive according to the criteria for Class 8 must be labelled with a 'Corrosive' subsidiary risk label.

A133 Substances must not be transported under this entry unless approved by the appropriate national authority on the basis of the results of appropriate tests according to Part I of the UN *Manual of Tests and Criteria*. Packaging must ensure that the percentage of diluent does not fall below that stated in the appropriate authority approval at any time during transport.

A134 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, transported with the battery(ies) installed.

A135 Substances and mixtures meeting the criteria for Class 8 must be labelled with a CORROSIVE subsidiary risk label.

A136 a) These substances are liable to exothermic decomposition at elevated temperatures. Decomposition can be initiated by heat or by impurities (e.g. powdered metals (iron, manganese, cobalt, magnesium) and their compounds).

b) During the course of transport, these substances must be shaded from direct sunlight and all sources of heat and be placed in adequately ventilated areas.

A137 This entry must not be used for Division 6.1 substances that meet the inhalation toxicity criteria for packing group I described in 2;6.2.2.4.3.

A138 This entry applies only to calcium hypochlorite, dry or hydrated, when transported in non friable tablet form.

A139 "Fissile-excepted"applies only to those packages complying with 6;7.10.2.

A140 For the purposes of documentation, the proper shipping name must be supplemented with the technicalname (see 1.2.7). Technical names need not be shown on the package. When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in category A and assignment to UN 2814 or UN 2900, the words "suspected category A infectious substance" must be shown, in parentheses, following the proper shipping name on the transport document, but not on the outer packagings.

A141 This entry applies to human or animal material including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluids, and body parts being transported for purposes such as research, diagnosis, investigational activities, disease treatment or prevention.

A142 It is intended that this entry will be deleted effective on 1 January 2007. Irrespective of Part 2, Introductory Chapter, 3.2 in the interim period, this entry or the appropriate generic entry may be used.

A143 These storage systems must always be considered as containing hydrogen.

A144 Protective Breathing Equipment (PBE) containing a small chemical oxygen generator for use by air crew 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 2 PBE may be contained in a package;

d) the statement "Air crew 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.

All other requirements applicable to chemical oxygen generators must apply except that the "cargo aircraft only" handling label must not be displayed.

— — — — — — — —

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:

Divisions 2.1 and 2.2	Aerosols and UN2037 without subsidiary risk
Division 2.2	Gases without subsidiary risk but excluding refrigerated liquefied gases
Class 3	Packing Groups II and III
Division 4.1	Packing Groups II and III but excluding all self-reactive substances irrespective of packing group
Division 4.3	Packing Groups II and III, solids only
Division 5.1	Packing Groups II and III
Division 5.2	Only when contained in a chemical kit or a first-aid kit
Division 6.1	Packing Groups II and III
Class 8	Packing Groups II and III but excluding UN Nos. 2794, 2795, 2803, 2809 and 3028
Class 9	Only UN Nos. 1941, 1990, 2071, 3077, 3082 and 3316

. . .

4.5 PACKAGE MARKING

. . .

4.5.2 Packages containing limited quantities of dangerous goods and prepared in accordance with this chapter must be marked ~~to indicate that they contain "limited quantities"~~ "limited quantity(ies)" or "LTD QTY" ~~in addition to the markings required by 4.5.1~~.

— — — — — — — —

PART 4 — PACKING INSTRUCTIONS

INTRODUCTORY NOTES

. . .

Note 9. — ***Additional requirements for the air mode***

The transport of dangerous goods by air is subject to requirements additional to those of other modes of transport (e.g. quantity limitations, requirements for absorbent material, pressure differential requirements, appropriate closure procedures, specific packing instruction requirements.

CHAPTER 1 — GENERAL PACKING REQUIREMENTS

1.1 GENERAL REQUIREMENTS APPLICABLE TO ALL CLASSES EXCEPT CLASS 7

. . .

1.1.8 Subject to 1.1.7 above an outer packaging may contain more than one item of dangerous goods provided that:

. . .

An outer packaging containing ~~must not contain inner packagings of~~ Division 6.2 (Infectious Substances) ~~and inner packagings of unrelated types of goods~~. may contain material for refrigeration or freezing or packaging material such as absorbent material.

Note.— For packages containing radioactive material, see 9.1.3.

. . .

1.1.21 For plastic drums and jerricans, unless otherwise approved by the appropriate national authority, the period of use permitted for the transport of dangerous goods must be not more than five years from the date of manufacture of the receptacles, except where a shorter period of use is prescribed because of the nature of the substance to be transported.

— — — — — — — —

CHAPTER 2 — GENERAL

. . .

2.4 Where the packing instructions in this part authorize the use of a particular type of ~~outer~~ packaging ~~in a combination packaging~~ (e.g. 4G, 1A2), packagings bearing the same packaging identification code followed by the letter "V" marked in accordance with the requirements of 6;4.1.7 h) (e.g. 4GV; 1A2V) may also be used under the same conditions and limitations applicable to the use of that type of ~~outer~~ packaging according to the relevant packing instruction. For example, a combination packaging marked with the packaging code "4GV" may be used whenever a combination packaging marked "4G" is authorized, provided the requirements in the relevant packing instruction regarding types of inner packagings and quantity limitations are respected.

— — — — — — — —

CHAPTER 4 — CLASS 2 — GASES

4.1 SPECIAL PACKING PROVISIONS FOR DANGEROUS GOODS OF CLASS 2

4.1.1 General requirements

4.1.1.1 This section provides general requirements applicable to the use of cylinders for the transport of Class 2 gases (e.g. ~~UN 1051 **Hydrogencyanide, stabilized**~~ UN 1072 **Oxygen, compressed**). Cylinders 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 which 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). The provisions of ISO 11114-1:1997 and ISO 11114-2:2000 must be met as applicable. Cylinders for UN 1001 **Acetylene, dissolved** and **UN 3374 Acetylene, solvent free** must be filled with a porous ~~material~~ mass, uniformly distributed, of a type that conforms to the requirements and testing specified by the appropriate national authority and which:

a) is compatible with the cylinder and does not form harmful or dangerous compounds either with the acetylene or with the solvent in the case of UN 1001; and

b) is capable of preventing the spread of decomposition of the acetylene in the porous mass. ~~In the case of UN 1001, the solvent must be compatible with the cylinders.~~

In the case of UN 1001, the solvent must be compatible with the cylinders.

4.1.1.3 Cylinders, including their closures, must be selected to contain a gas or a mixture of gases according to the requirements of 6;5.1.2 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;5.1.5 have been performed.

4.1.1.5 Prior to filling, the filler must perform an inspection of the cylinder and ensure that the cylinder is authorized for the gas to be transported and that the provisions of these Instructions have been met. Shut-off valves must be closed after filling and remain closed during transport. The ~~consignor~~ shipper must verify that the closures and equipment are not leaking.

4.1.1.~~5~~6 Cylinders must be filled according to the working pressures, filling ratios and provisions specified in the appropriate packing instruction for the specific substance being filled. 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.~~6~~7 Cylinders, including their closures, must conform to the design, construction, inspection and testing requirements detailed in Part 6, Chapter 5. 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.~~7~~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, by one of the following methods:

a) Valves are placed inside the neck of the cylinder and protected by a threaded plug or cap;

b) Valves are protected by caps. Caps must possess vent-holes of sufficient cross-sectional area to evacuate the gas if leakage occurs at the valves;

c) Valves are protected by shrouds or guards;

~~d) Valves are designed and constructed in such a way that they are inherently able to withstand damage without leakage of product;~~

~~e~~)d Not used; or

~~f~~)e Cylinders are transported in an outer packaging. The packaging as prepared for transport must be capable of meeting the drop test specified in 6;5.5.3 at the packing group I performance level.

For cylinders with valves as described in (b) and (c), the requirements of ISO11117:1998 must be met; for ~~unprotected~~ valves with inherent protection ~~as described in (d)~~, the requirements of annex B of ISO 10297:1999 must be met.

4.1.1.~~8~~9 Non-refillable cylinders must:

a) be transported in an outer packaging, such as a box, or crate, or in shrink-wrapped trays or stretch- wrapped trays;

b) be of a water capacity less than or equal to 1.25 litres when filled with flammable or toxic gas;

c) not be repaired after being put into service.

4.1.1.~~9~~10 Refillable cylinders, other than cryogenic receptacles, must be periodically inspected according to the provisions of 6; 5.1.5 and packing instructions~~s~~ PI 200 ~~or P202 as applicable~~. Cylinders must

not be ~~charged or~~ filled after they become due for periodic inspection but may be transported after the expiry of the time limit.

4.1.1.~~10~~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, ~~consistent with the applicable design and construction standards~~. 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.~~11~~12 Cylinders must not be offered for filling:

a) when damaged to such an extent that the integrity of the cylinder or its service equipment may be affected;

b) unless the cylinder and its service equipment has been examined and found to be in good working order; ~~and~~ or

c) unless the required certification, retest, and filling markings are legible.

4.1.1.~~12~~13 ~~Charged~~ Filled cylinders must not be offered for transport;

a) when leaking;

b) when damaged to such an extent that the integrity of the cylinder or its service equipment may be affected;

c) unless the cylinder and its service equipment has been examined and found to be in good working order; ~~and~~ or

d) unless the required certification, retest, and filling markings are legible.

. . .

200	PACKING INSTRUCTION 200	200

Table 2. LIQUEFIED GASES AND DISSOLVED GASES

UN No.	Name and description	Class or Division	Subsidiary risk	LC_{50} ml/m³	Cylinders	Test period, years	Test pressure, bar	Filling ratio	Special packing provisions
1010	**Butadienes and hydrocarbon mixture,stabilized** ~~(mixtures of 1,3-butadiene and hydrocarbons)~~ containing more than 40% butadienes	2.1			X	10	~~10~~	~~0.50~~	v z

— — — — — — — —

CHAPTER 8 — CLASS 6 — TOXIC AND INFECTIOUS SUBSTANCES

P602	PACKING INSTRUCTION	P602

This instruction applies to UN Nos. 2814 and 2900.

The following packagings are authorized provided the special packing provisions are met:

Packagings meeting the requirements of Part 6, Chapter 6 and approved accordingly consisting of:

a) Inner packagings comprising:

i) watertight primary receptacle(s);

ii) a watertight secondary packaging;

iii) other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple fragile primary receptacles are placed in a single secondary packaging, they shall be either individually wrapped or separated so as to prevent contact between them;

(b) A rigid outer packaging of adequate strength for its capacity, mass and intended use. The smallest external dimension must be not less than 100 mm.

Additional requirements:

1. Inner packagings containing infectious substances must not be consolidated with inner packagings containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions of Part 1;3.1 and 5;1.1 j): such an overpack may contain dry ice

2. Other than for exceptional consignments, e.g. whole organs which require special packaging, the following additional requirements must apply:

a) Substances consigned at ambient temperatures or at a higher temperature. Primary receptacles must be of glass, metal or plastics. Positive means of ensuring a leakproof seal must be provided, e.g. a heat seal, a skirted stopper or a metal crimp seal. If screw caps are used, they must be secured by positive means, e.g., tape, paraffin sealing tape or manufactured locking closure;

b) Substances consigned refrigerated or frozen. Ice, dry ice or other refrigerant must be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6;2.2.2. Interior supports must be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack must be leakproof. If dry ice is used, the outer packaging or overpack must permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging must maintain their integrity at the temperature of the refrigerant used;

c) Substances consigned in liquid nitrogen. Plastics primary receptacles capable of

P602	PACKING INSTRUCTION	P602

withstanding very low temperature must be used. The secondary packaging must also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen must also be fulfilled. The primary receptacle and the secondary packaging must maintain their integrity at the temperature of the liquid nitrogen.

d) Lyophilized substances may also be transported in primary receptacles that are flame-sealed glass ampoules or rubber-stoppered glass vials fitted with metal seals;

3. Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging must be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range -40 ºC to +55 ºC.

Special packing provisions

1) Shippers of infectious substances must ensure that packages are prepared in such a manner that they arrive at their destination in good condition and present no hazard to persons or animals during transport.

2) The definition in Part 1, Chapter 3 and the general packing provision of Part 4, Chapter 1, apply to infectious substances packages.

3) An itemized list of contents must be enclosed between the secondary packaging and the outer packaging. When the infectious substances to be transported are unknown, but suspected of meeting the criteria for inclusion in Category A and assignment to UN 2814 or UN 2900, the words “suspected category A infectious substance” must be shown, in parentheses following the proper shipping name on the itemized list of contents inside the outer packaging.

— — — — — — — —

P650	PACKING INSTRUCTION	P650

This packing instruction applies to UN 3373

1) The packaging must be of good quality, strong enough to withstand the shocks and loadings normally encountered during transport, including transhipment between transport units and between transport units and warehouses as well as any removal from a pallet or overpack for subsequent manual or mechanical handling. Packagings must be constructed and closed to prevent any loss of contents that might be caused under normal conditions of transport by vibration or by changes in temperature, humidity or pressure.

2) The packaging must consist of three components:

a) a primary receptacle;

b) a secondary packaging; and

c) a rigid outer packaging.

3) Primary receptacles must be packed in secondary packagings in such a way that, under normal conditions of transport, they cannot break, be punctured or leak their contents into the secondary packaging. Secondary packagings must be secured in outer packagings with suitable cushioning material. Any leakage of the contents must not compromise the integrity of the cushioning material or of the outer packaging.

4) For transport, the mark illustrated below must be displayed on the external surface of the outer packaging on a background of a contrasting colour and must be clearly visible and legible. The mark must be in the form of a square set an angle of 45° (diamond-shaped) with each side having a length of at least 50 mm, the width of the line must be at least 2 mm; and the letters and numbers must be at least 6 mm high. The proper shipping name “Diagnostic specimen” or “Clinical specimen” in letters at least 6mm high must be marked on the outer package adjacent to the diamond-shaped mark.

P650	PACKING INSTRUCTION	P650

5) At least one surface of the outer packaging must have a minimum dimension of 100 mm x 100 mm.

6) The completed package must be capable of successfully passing the drop test in 6;6.2 as specified in 6;6.1.5 of the Instructions except that the height of the drop must not be less than 1.2 m.

7) For liquid substances

a) The primary receptacle(s) must be leakproof and must not contain more than 1 litre;

b) The secondary packaging must be leakproof;

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

d) Absorbent material must be placed between the primary receptacle(s) and the secondary packaging. The absorbent material must be in quantity sufficient to absorb the entire contents of the primary receptacle(s) so that any release of the liquid substance will not compromise the integrity of the cushioning material or of the outer packaging;

e) The primary receptacle or the secondary packaging must be capable of withstanding, without leakage, an internal pressure of 95 kPa (0.95 bar);

f) The outer package must not contain more than 4 litres. This quantity excludes ice, dry ice, or liquid nitrogen when used to keep specimens cold.

8) For solid substances

a) The primary receptacle(s) must be siftproof and must not exceed the outer packaging mass limit;

b) The secondary packaging must be siftproof;

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

d) Except for packages containing body parts, organs or whole bodies, the outer package must not contain more than 4 kg. This quantity excludes ice, dry ice or liquid nitrogen when used to keep specimens cold.

e) If there is any doubt as to whether or not residual liquid may be present in the primary receptacle during transport then a packaging suitable for liquids, including absorbent materials, must be used.

P650	PACKING INSTRUCTION	P650

9) Refrigerated or frozen specimens: Ice, dry ice and liquid nitrogen

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

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

10) When packages are placed in an overpack, the package markings required by this packing instruction must either be clearly visible or be reproduced on the outside of the overpack.

11) Infectious substances assigned to UN 3373 which are packed and marked in accordance with this packing instruction are not subject to any other requirement in these Instructions except for the following:.

i) the proper shipping name, UN number and the name, address and telephone number of a responsible person must be provided on a written document (such as an air waybill) or on the package;

ii) classification must be in accordance with 2;6.3.2;

iii) the incident reporting requirements in 7;4.4 must be met; and

iv) the inspection for damage or leakage requirements in 7;3.1.3 and 7;3.1.4

v) passengers and crew members are prohibited from transporting infectious substances either as or in carry-on baggage or checked baggage or on their person.

12) Clear instructions on filling and closing such packages must be provided by packaging manufacturers and subsequent distributors to the consignor or to the person who prepares the package (e.g. patient) to enable the package to be correctly prepared for transport.

13) Other dangerous goods must not be packed in the same packaging as Division 6.2 infectious substances unless they are necessary for maintaining the viability, stabilizing or preventing degradation or neutralizing the hazards of the infectious substances. A quantity of 30 ml or less of dangerous goods included in Classes 3, 8 or 9 may be packed in each primary receptacle containing infectious substances. When these small quantities of dangerous goods are packed with infectious substances in accordance with this packing instruction no other requirements in these

P650	PACKING INSTRUCTION	P650
	Instructions need be met.	

— — — — — — — —

CHAPTER 11 — CLASS 9 — MISCELLANEOUS DANGEROUS GOODS

900	PACKING INSTRUCTION 900	900

Vehicles, machines or equipment containing internal combustion engines or batteries must meet the following requirements:

.....

b) 1) for flammable gas-powered vehicles, machines or equipment, pressurized vessels containing the flammable gas must be completely emptied of flammable gas. Lines from vessels to gas regulators, and gas regulators themselves, must also be drained of all trace of flammable gas. To ensure that these conditions are met, gas shut-off valves must be left open and connections of lines to gas regulators must be left disconnected upon delivery of the vehicle to the operator. Shut-off valves must be closed and lines reconnected at gas regulators before loading the vehicle aboard the aircraft;

or alternatively,

2) flammable gas-powered vehicles, machines or equipment, which have pressure receptacles (fuel tanks) that are equipped with electrically operated valves, which close automatically in case the power is disconnected or with manual shut off valves, may be transported under the following conditions:

i) the valves must be in the closed position and in the case of electrically operated valves, power to those valves must be disconnected;
ii) after closing the valves, the vehicle, equipment or machinery must be operated until it stops from lack of fuel before being loaded aboard the aircraft;
iii) in no part of the system between the pressure receptacle and the shut off valve shall the pressure exceed more than 5% of the maximum allowable working pressure of the system.

. . .

d) there must not be any residual liquefied gas in the system, including the fuel tank

.....

. . .

904	PACKING INSTRUCTION 904	904

Solid carbon dioxide (dry ice) when offered for transport by air must be packed in accordance with the general packing requirements of Part 4, Chapter 1 and be in packaging designed and constructed to permit the release of carbon dioxide gas to prevent a build-up of pressure that could rupture the packaging. Arrangements between shipper and operator(s) must be made for each shipment, to ensure that ventilation safety procedures are followed. The dangerous goods transport document requirements of Part ~~4~~ 5 ~~;~~ , Chapter 1 are not applicable provided alternative written documentation is supplied containing the following information: ~~required by 5;4.1, excluding the packing instruction number and packing group~~ proper shipping name (**Dry ice** or **Carbon dioxide, solid**), class 9, UN number 1845, the number of packages and the net quantity of dry ice in each package. The information must be included with the description of the goods. The net mass of the **Carbon dioxide, solid** (**Dry ice**) must be marked on the outside of the package.

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

. . .

910	PACKING INSTRUCTION 910	910

Consumer commodities are materials that are packaged and distributed in a form intended or suitable for retail sale for 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 Part 4, Chapter 1 or Part 6 of these Instructions; they must, however, comply with all other applicable requirements.

a) Each packaging must be designed and constructed to prevent leakage that may be caused by changes in altitude and temperature during air transport.

. . .

l) The gross mass on the dangerous goods transport document must be shown as:

1) for one package, the actual gross mass of the package;

2) for more than one package, either the actual gross mass of each package or as the average mass of the packages. (For example, if there are 10 packages and the total gross mass of them is 100 kg, the dangerous goods transport document may show this as “average gross mass per package 10 kg”.)

~~+ m) Packages must be marked to indicate that the shipper has determined that the packaging meets the applicable air transport requirements as specified in 5;2.4.12.~~

— — — — — — — —

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:

. . .

f) proper shipping names, UN numbers, labels, "limited quantities" (when applicable) and special handling instructions appearing on the interior packages are clearly visible or reproduced on the outside of the overpack (for an overpack containing packages of radioactive material, see 3.2.6);

g) ~~when these Instructions require the use of packagings bearing UN Specification Markings or Type A or B packagings for radioactive material, the statement "Inner packages comply with prescribed specifications" appears on an overpack used to enclose these packages, unless such markings are visible;~~ Packaging specification markings need not be reproduced on the overpack. The overpack marking is an indication that packages contained within comply with prescribed specifications.

h) the dangerous goods are not included in any freight container/unit load device except for radioactive material as specified in 7;2.9 (this does not apply to a unit load device containing consumer commodities prepared according to Packing Instruction 910 or dry ice used as a refrigerant for other than dangerous goods or, with the approval of the operator, magnetized material);

i) before a package or overpack is reused, all inappropriate dangerous goods labels and markings are removed or completely obliterated; and

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 is an indication of compliance with this requirement. The intended function of each package must not be impaired by the overpack.

Note.— For cooling purposes, an overpack may contain dry ice, provided that the overpack meets the requirements of Packing Instruction 904.

1.2 ADDITIONAL GENERAL REQUIREMENTS FOR INFECTIOUS SUBSTANCE

~~1.2.1 The transport of infectious substances requires coordinated action by the shipper, the operator and the consignee to ensure safe transport and arrival on time and in proper condition. To this end, the following measures must be taken:~~

~~a) Advance arrangements between shipper, operator and consignee. Dispatch of infectious substances must not take place before advance arrangements have been made between shipper, operator or consignee and before the consignee has confirmed with his appropriate national authorities that the substances can legally be imported and that no delay will be incurred in the delivery of the consignment to its destination.~~

~~b) Preparation of dispatch documents. In order to secure transmission without hindrance it is necessary to prepare all dispatch documents, including the transport document (see Chapter 4), in strict accordance with rules governing the acceptance of goods to be dispatched;~~

~~c) Routing. Whatever the mode used, transport must be by the quickest routing. If transhipment is necessary, precautions must be taken to ensure special care, expeditious handling and monitoring of the substances in transit.~~

~~d) Timely notification of all transport data by shipper to consignee. The shipper must notify the consignee in advance of transport details. The most rapid means of communication must be used for this notification.~~

~~1.2.2 Live vertebrate or invertebrate animals must not be used to consign infectious substances unless such substances cannot be consigned by any other means. Infected live animals must not be transported by air unless exempted in accordance with Part 1;1.1.2.~~

1.3 GENERAL PROVISIONS FOR CLASS 7

1.3.1 Requirements before shipments. . .

1.3.1.2 *Each shipment*

Before each shipment of any package, the following requirements must be fulfilled:

a) For any package it must be ensured that all the requirements specified in the relevant provisions of these Instructions have been satisfied;

b) It must be ensured that lifting attachments which do not meet the requirements of 6;7.1.2 have been removed or otherwise rendered incapable of being used for lifting the package, in accordance with 6;7.1.3;

c) For each Type B(U), Type B(M) and Type C package and for each package containing fissile material, it must be ensured that all the requirements specified in the approval certificates have been satisfied;

d) Each Type B(U), Type B(M) and Type C package must be held until equilibrium conditions have been approached closely enough to demonstrate compliance with the requirements for temperature and pressure unless an exemption from these requirements has received unilateral approval;

e) For each Type B(U), Type B(M) and Type C package, it must be ensured by inspection and/or appropriate tests that all closures, valves, and other openings of the containment system through which the radioactive contents might escape are properly closed and, where appropriate, sealed in the manner for which the demonstrations of compliance with the requirements of 6;7.7.7 and 6;7.9.3 were made;

f) For each special form radioactive material, it must be ensured that all the requirements specified in the ~~special form~~ approval certificate and the relevant provisions of these Instructions have been satisfied;

g) For packages containing fissile material, the measurement specified in 6;7.10.4 b) and the tests to demonstrate closure of each package as specified in 6;7.10.7 must be performed where applicable;

h) For each low dispersible radioactive material, it must be ensured that all the requirements specified in the approval certificate and the relevant provisions of these Instructions have been satisfied.

— — — — — — — —

1.7 EMPTY PACKAGINGS

. . .

1.7.2 Before an empty packaging which had previously contained an infectious substance is ~~referred~~ returned to the shipper, or sent elsewhere, it must be thoroughly disinfected or sterilized and any label or marking indicating that it had contained an infectious substance must be removed or obliterated.

— — — — — — — —

CHAPTER 2 — PACKAGE MARKINGS

2.4 MARKING SPECIFICATIONS AND REQUIREMENTS

. . .

2.4.5 Special marking requirements for radioactive material

a) each package of gross mass exceeding 50 kg must have its permissible gross mass legibly and durably marked on the outside of the packaging;

b) each package which conforms to:

i) ~~an Industrial~~ a Type IP-1 package, ~~Type 1, an Industrial~~ a Type IP-2 package ~~Type 2~~ or ~~an Industrial~~ a Type IP-3 package ~~Type 3~~ design must be legibly and durably marked on the outside of the packaging with "TYPE IP-1", "TYPE IP-2" or "TYPE IP-3" as appropriate;

ii) a Type A package design must be legibly and durably marked on the outside of the packaging with "TYPE A";

iii) ~~an Industrial~~ a Type IP-2 package, ~~Type 2, an Industrial~~ a Type IP-3 package ~~Type 3~~ or a Type A package design must be legibly and durably marked on the outside of the packaging with the international vehicle registration code (VRI Code) of the country of origin of design and the name of the manufacturers, or other identification of the packaging specified by the competent authority.

c) each package which conforms to a design approved by the competent authority must be legibly and durably marked on the outside of the packaging with:

i) the identification mark allocated to that design by the competent authority;

ii) a serial number to uniquely identify each packaging which conforms to that design;

iii) in the case of a Type B(U) or Type B(M) package design, with "TYPE B(U)" or "TYPE B(M)"; and

iv) in the case of a Type C package design, with "TYPE C".

d) each package which conforms to a Type B(U), Type B(M) or Type C package design must have the outside of the outermost receptacle which is resistant to the effects of fire and water plainly marked by embossing, stamping or other means resistant to the effects of fire and water with the trefoil symbol, as shown in Figure 5-1 below:

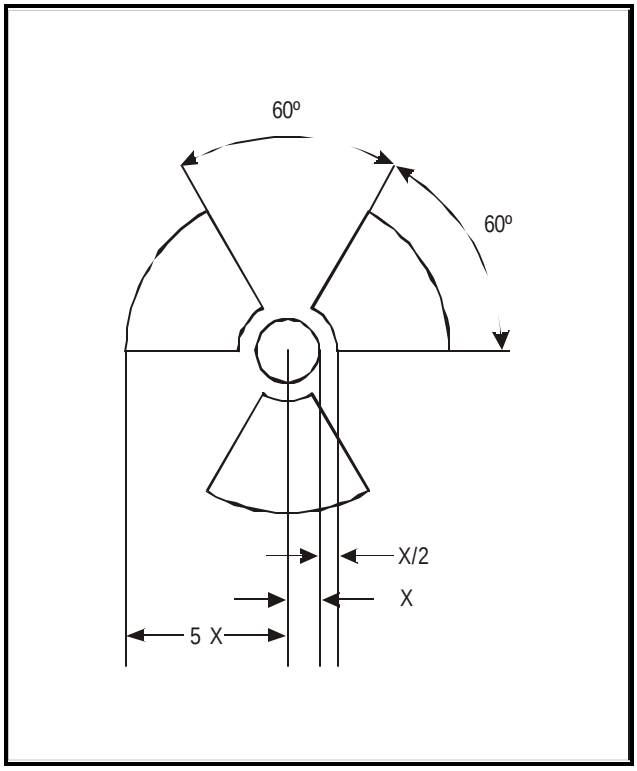


Figure 5-1. Basic trefoil symbol with proportions based on a central circle of radius X. The minimum allowable size of X must be 4 mm.

e) each excepted package must be marked with the UN number, preceded by the letters "UN".

. . .

2.4.9 Marking of overpacks

~~a)~~ ~~Proper shipping names, UN numbers,~~ An overpack must be marked with the word "Overpack", with the proper shipping name, UN number, "limited quantities" (when applicable), ~~the~~ air eligibility marking (when applicable), ~~and~~ special handling instructions and labelled, as required for packages by Chapter 3, for each item of dangerous goods contained in the overpack unless markings and labels representative of all dangerous goods in the overpack are visible. ~~appearing on interior packages must be clearly visible, or reproduced on the outside of the overpack.~~

~~b) When these Instructions require the use of packagings bearing UN Specification Markings or Type A or B packagings for radioactive material, the statement "Inner packages comply with prescribed specifications" must appear on an overpack used to enclose these packages, unless such markings are visible.~~

b) Where packages containing diagnostic specimens are placed in an overpack, the words "Diagnostic Specimens" and the air eligibility marking, appearing on packages within must be clearly visible, or must be reproduced on the outside of the overpack.

2.4.10 Markings of packages containing dangerous goods in limited quantities

Packages containing limited quantities of dangerous goods and prepared in accordance with 3;4 must be marked ~~to indicate that they contain "limited quantities". See 3;4.5.2.~~ "limited quantity(ies)" or "LTD QTY".

. . .

~~**2.4.12 Air eligibility marking**~~

~~From 1 January 2004, packagings, Packages, including those used for limited quantities of dangerous goods, must **may** be marked to indicate that the shipper has determined that the packaging package meets the applicable air transport requirements. The marking must **should** be applied as prescribed in 2.2 and must be placed adjacent to the markings prescribed in 2.4.1, or for limited quantity packagings, adjacent to the marking prescribed in 2.4.10. The marking must **should** be durable, legible and of such a size relative to the packaging package as to be readily visible. The marking must **should** include the symbol consisting of an aircraft within a circle as shown below and may include the words "Air Eligible".~~

~~*Note.— This marking may be applied to packagings from 1 January 2003.*~~

2.4.12 Special marking requirement for chemical oxygen generators

When chemical oxygen generators contained in Protective Breathing Equipment (PBE) are being transported under Special Provision A144, the statement "Air Crew Protective Breathing Equipment (smoke hood) in accordance with Special Provision A144 shall be marked adjacent to the proper shipping name on the package.

— — — — — — — —

CHAPTER 3 — LABELLING

. . .

3.2 APPLICATION OF LABELS

. . .

3.2.7 Except as provided in 3.4.1.1 d each label must:

a) be affixed to a background of contrasting colour or must have a dotted or solid line outer boundary;

b) be located on the same surface of the package near the proper shipping name marking, if the package dimensions are adequate;

c) be so placed on the packaging that they are not covered or obscured by any part of or attachment to the packaging or any other label or marking; and

d) when primary and subsidiary risk labels are required, be displayed next to each other.

. . .

3.2.11 In addition to the class hazard labels specified in 3.1, handling labels must also be affixed to packages of dangerous goods as follows:

a) the "Cargo aircraft only" label (Figure 5-~~21~~23) must be affixed:

1) when the package containing the dangerous goods may only be transported on a cargo aircraft. However, where the packing instruction number and the permitted quantity per package are identical for passenger and cargo aircraft, the "Cargo aircraft only" label should not be used;

2) to each Type B(M) package of radioactive material and any freight container containing such a Type B(M) package;

3) on the same surface of the package near the hazard labels;

b) when required by the provisions of ~~3~~4;1.1.13, either the "Package Orientation" label (Figure 5-24), or pre-printed package orientation labels meeting the same specification as either Figure 5-~~22~~24 or ISO Standard 780-1985, 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 words "Dangerous Goods" may be inserted on the label below the line;

c) for packages containing refrigerated liquefied gases, the "Cryogenic liquid" label (Figure 5-26) must be affixed on all packages.

d) for packages containing self-reactive substances of Division 4.1 or Division 5.2 organic peroxides, the “Keep Away From Heat” label (Figure 5-27) must be affixed on all packages. This label should be affixed on the same surface of the package near the hazard label(s).

e) for excepted packages of radioactive material the "Radioactive Material - Excepted Package" handling label (Figure 5-28) must be affixed.

Figure 5-27


Radioactive Material, Excepted Package
This package contains radioactive material, excepted package and is in all respects in compliance with the applicable international and national govermental regulations.
UN
The information for this package need not appear on the Notification to Captain (NOTOC)

Figure 5-28

— — — — — — — — —

3.4.1 Class hazard label specifications

3.4.1.1 Class hazard labels must conform to the following specifications:

a) They must be in the form of a square with minimum dimensions of 100 mm × 100 mm, set at an angle of 45E (diamond shaped) except that labels of 50 mm × 50 mm may be used on packages containing infectious substances where the packages are of dimensions such that they can only bear smaller labels. The labels have a line of the same colour as the symbol, 5 mm inside the edge and running parallel to it. Labels are divided into halves. With the exception of Divisions 1.4, 1.5 and 1.6, the upper half of the label is reserved for the pictorial symbol and the lower half for texts and the class or division number and the compatibility group letter as appropriate.

b) The symbols, texts and numbers must be shown in black on all labels except:

i) the Class 8 label, where the text (if any) and class number must appear in white;

ii) labels with entirely green, red or blue backgrounds, where they may be shown in white.

c) Except for Divisions 1.4, 1.5 and 1.6, labels for Class 1 show in the lower half the division number and compatibility group letter for the substance or article. Labels for Divisions 1.4, 1.5 and 1.6 must show in the upper half the division number and in the lower half the compatibility group letter.

d) Cylinders for Class 2 may, on account of their shape, orientation and securing mechanisms for transport, bear labels representative of those specified in this chapter, which have been reduced in size, according to ISO 7225:1994, for display on the non-cylindrical part (shoulder) of such cylinders. Labels may overlap to the extent provided for by ISO 7225:1994 “Gas cylinders - Precautionary labels”; however, in all cases, the labels representing the primary hazard and the numbers appearing on any label must remain fully visible and the symbols recognizable.

~~d)~~ e) In the case of labels for Class 5, the division number of the substance must be shown in the bottom corner of the label. For all other labels, the class number must be shown in the bottom corner of the label.

. . .

Figure 5-25

Editorial Note.— Amend distance of black line running inside the edge of the placard to 5 mm.

— — — — — — — —

CHAPTER 4 — DOCUMENTATION

Note 1. — In addition to the provisions of this section, other elements of information may be required by the appropriate national authority or for certain modes of transport (e.g. flashpoint or flashpoint range in °C).

Note 2. — These Instructions do not preclude the use of electronic data processing (EDP) and electronic data interchange (EDI) transmission techniques as an aid to paper documentation, unless otherwise indicated.

4.1.3 Shipper, and consignee ~~and date~~

The name and address of the shipper and the consignee of the dangerous goods must be included on the dangerous goods transport document.

. . .

4.1.5.4 ~~Not used~~ *Chemical oxygen generators*

4.1.5.4.1 When chemical oxygen generators contained in Protective Breathing Equipment (PBE) are being transported under Special Provision A144, the statement "Air Crew Protective Breathing Equipment (smoke hood) in accordance with Special Provision A144 must be included on the Dangerous Goods Transport Document

. . .

4.1.5.7 *Radioactive material*

4.1.5.7.1 The following information must be included for each consignment of Class 7 material, as applicable, in the order given:

a) The name or symbol of each radionuclide or, for mixtures of radionuclides, an appropriate general description or a list of the most restrictive nuclides;

b) A description of the physical and chemical form of the material, or a notation that the material is special form radioactive material or low dispersible radioactive material. A generic chemical description is acceptable for chemical form;

c) The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with an appropriate SI prefix (see 1.2.2.1). For fissile material, the mass of fissile material in units of grams (g), or appropriate multiples thereof, may be used in place of activity;

d) The category of the package, i.e. I-WHITE, II-YELLOW, III-YELLOW;

e) The transport index (categories II-YELLOW and III-YELLOW only);

f) For consignments including fissile material other than consignments excepted under 6.4.11.2, the criticality safety index;

g) The identification mark for each competent authority approval certificate (special form radioactive material, low dispersible radioactive material, special arrangement, package design, or shipment) applicable to the consignment;

h) For consignments of more than one package, the information contained in 4.1.4.1 a) to c) and 4.1.5.7.1 a) to g) must be given for each package. For ~~consignments of~~ packages in an overpack or freight container, a detailed statement of the contents of each package within the overpack or freight container and, where appropriate, of each overpack or freight container ~~in the consignment~~ must be included. If packages are to be removed from the overpack or freight container at a point of intermediate unloading, appropriate transport documents must be made available;

i) Where a consignment is required to be shipped under exclusive use, the statement "EXCLUSIVE USE SHIPMENT"; and

j) For LSA-II, LSA-III, SCO-I and SCO-II, the total activity of the consignment as a multiple of A_2.

4.1.6 Certification

4.1.6.1 The dangerous goods transport document must include a certification or declaration that the consignment is acceptable for transport and that the goods are properly packaged, marked and labelled, and in proper condition for transport in accordance with the applicable regulations and including additional air transport requirements of these Instructions (examples of additional air transport requirements are indicated in 5;1.1).

The text for this certification is:

"I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations."

For air transport the following additional statement is required:
"I declare that all of the applicable air transport requirements have been met."

The certification must be signed and dated by the shipper. Facsimile signatures are acceptable where applicable laws and regulations recognize the legal validity of facsimile signatures.

Note. — The word "placarded" is not essential for shipments by air.

. . .

~~**4.2 INFECTIOUS SUBSTANCES**~~

~~Unless an infectious substance cannot be consigned by any other means, live vertebrate or invertebrate animals must not be used to consign such a substance. Infected animals must be consigned in accordance with conditions specified by the competent authority.~~

— — — — — — — —

PART 6 — PACKING NOMENCLATURE, MARKING REQUIREMENTS AND TESTS

CHAPTER 1 — APPLICABILITY, NOMENCLATURE AND CODES

. . .

1.2 CODES FORDESIGNATING TYPESOF PACKAGINGS

. . .

1.2.5 The following numerals must be used for the kinds of packaging:

1. Drum
2. ~~Wooden barrel (not used in these Instructions)~~ Reserved
3. Jerrican
4. Box
5. Bag
6. Composite packaging

. . .

1.3 INDEX OF PACKAGINGS

Table 6-2 contains an index of packagings, other than inner packagings, referred to in Chapters 1 to 4. It lists all the packagings, except inner packagings, specified in the United Nations Recommendations for the transport of dangerous goods, and notes those not used in these Instructions for air transport. The index lists the number of the paragraph containing the requirements of those packagings used in these Instructions. The performance tests are specified in Chapter 4. Table 6-3 contains an index of inner packagings and lists the paragraph number containing the requirements together with, where applicable, individual performance tests (e.g. for aerosols).

Table 6-2. Index of packagings other than inner packagings

Kind	*Code and, where applicable, category*		*Para-graph*	*Maximum capacity (L)*	*Maximum net mass (kg)*
Steel drums	1A1	non-removable head	3.1.1	450	400
	1A2	removable head	3.1.1	450	400
Aluminium drums	1B1	non-removable head	3.1.2	450	400
	1B2	removable head	3.1.2	450	400

Kind	*Code and, where applicable, category*		*Para-graph*	*Maximum capacity (L)*	*Maximum net mass (kg)*
Metal (other than steel or aluminium) drums	1N1	non-removable head	3.1.3	450	400
	1N2	removable head	3.1.3	450	400
Steel jerricans	3A1	non-removable head	3.1.4	60	120
	3A2	removable head	3.1.4	60	120
Aluminium jerricans	3B1	non-removable head	3.1.4	60	120
	3B2	removable head	3.1.4	60	120
Plywood drums	1D		3.1.5	250	400
~~Wooden barrels~~ Reserved	~~2C1~~	~~bung type~~	~~Not used in these Instructions~~		
	~~2C2~~	~~removable head~~			
Fibre drums	1G		3.1.6	450	400
Plastic drums and jerricans	1H1	drums, non-removable head	3.1.7	450	400
	1H2	drums, removable head	3.1.7	450	400
	3H1	jerricans, non-removable head	3.1.7	60	120
	3H2	jerricans, removable head	3.1.7	60	120
Boxes of natural wood	4C1	ordinary	3.1.8		400
	4C2	with sift-proof walls	3.1.8		400
Plywood boxes	4D		3.1.9		400
Reconstituted wood boxes	4F		3.1.10		400

— — — — — — — —

CHAPTER 2 — MARKING OF PACKAGINGS OTHER THAN INNER PACKAGINGS

2.1 MARKING REQUIREMENTS FOR PACKAGINGS OTHER THAN INNER PACKAGINGS

. . .

2.1.2 In addition to the durable markings prescribed in 2.1.1, every new metal drum of a capacity greater than 100 L must bear the marks described in 2.1.1. a) to e) on the bottom, with an indication of the nominal thickness of at least the metal used in the body (in mm, to 0.1 mm), in a permanent form (e.g. embossed). When the nominal thickness of either head of a metal drum is thinner than that of the body, the nominal thicknesses of the top head, body and bottom head must be marked on the bottom in a permanent form (e.g. embossed), for example '1.0-1.2-1.0' or '0.9-1.0-1.0'. Nominal thicknesses of metal must be determined according to the appropriate ISO Standard, for example ISO 3574:~~1986~~ 1999 for steel. The marks indicated in 2.1.1 f) and g) must not be applied in a permanent form (e.g. embossed) except as provided for in 2.1.5.

. . .

2.1.6 Packagings manufactured with recycled plastic material as defined in 1;3 must be marked "REC". This mark must be placed near the mark prescribed in 2.1.1.

Editorial Note.— Renumber subsequent paragraphs

— — — — — — — —

CHAPTER 3 — REQUIREMENTS FOR PACKAGINGS

3.1 REQUIREMENTS FORPACKAGINGS OTHER THANINNER PACKAGINGS

3.1.1 Steel drums

1A1 non-removable head
1A2 removable head

3.1.1.1 Body and heads must be constructed of steel sheet of a suitable type and of adequate thickness in relation to the capacity of the drum and to its intended use.

Note. — In the case of carbon steel drums, "suitable" steels are identified in ISO 3573:1999 "Hot rolled carbon steel sheet of commercial and drawing qualities" and ISO 3574:1999 "Cold - reduced carbon steel of commercial and drawing qualities". For carbon steel drums below 100 litres, "suitable" steels in addition to the above standards are also identified in ISO 11949:1995 "Cold-reduced electrolytic tinplate", ISO 11950:1995 "Cold-reduced electrolytic chromium/chromium oxide-coated steel" and ISO 11951:1995 "Cold-reduced blackplate in coil form for the production of tinplate or electrolytic chromium/chromium-oxide coated steel".

. . .

3.1.7 Plastic drums and jerricans

1H1 drums, non-removable head
1H2 drums, removable head
3H1 jerricans, non-removable head
3H2 jerricans, removable head

3.1.7.1 The packaging must be manufactured from suitable plastic material and be of adequate strength in relation to its capacity and intended use. Except for recycled plastic material as defined in 1.2, no used material other than production residues or regrind from the same manufacturing process may be used. The packaging must be adequately resistant to aging and to degradation caused either by the substance contained or by ultraviolet radiation. Any permeation of the substance contained must not constitute a danger under normal conditions of transport.

~~3.1.7.2 Unless otherwise approved by the appropriate national authority, the period of use permitted for the transport of dangerous substances must not exceed five years from the date of manufacture of the packaging except where a shorter period of use is prescribed because of the nature of the substance to be transported. Packagings manufactured with such recycled plastic material must be marked 'REC' near the marks prescribed in 2.1.~~

Editorial Note.— renumber subsequent paragraphs

. . .

REQUIREMENTS FOR PACKAGINGS

3.1.18 Composite packagings (plastic material)

6HA1 plastic receptacle with outer steel drum
6HA2 plastic receptacle with outer steel crate*/or box
6HB1 plastic receptacle with outer aluminium drum
6HB2 plastic receptacle with outer aluminium crate*/or box
6HC plastic receptacle with outer wooden box
6HD1 plastic receptacle with outer plywood drum
6HD2 plastic receptacle with outer plywood box
6HG1 plastic receptacle with outer fibre drum
6HG2 plastic receptacle with outer fibreboard box
6HH1 plastic receptacle with outer plastic drum
6HH2 plastic receptacle with outer solid plastic box

3.1.18.1 *Inner receptacle*

3.1.18.1.1 The provisions of 3.1.7.1 and 3.1.7.~~4~~3 to 3.1.7.~~7~~6 apply to inner plastic receptacles.

3.1.18.1.2 The inner plastic receptacle must fit snugly inside the outer packaging, which must be free of any projection that might abrade the plastic material.

3.1.18.1.3 Maximum capacity of inner receptacles:

6HA1, 6HB1, 6HD1, 6HG1, 6HH1: 250 L;
6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2: 60 L.

3.1.18.1.4 Maximum net mass:

6HA1, 6HB1, 6HD1, 6HG1, 6HH1: 400 kg;
6HA2, 6HB2, 6HC, 6HD2, 6HG2, 6HH2: 75 kg.

— — — — — — — —

CHAPTER 4 — PACKAGING PERFORMANCE TESTS

. . .

4.2 PREPARATION OF PACKAGINGS FOR TESTING

4.2.1 Tests must be carried out on packagings prepared as for transport including, with respect to combination packagings, the inner packagings used. Inner or single receptacles or packagings must be filled to not less than 98 per cent of their maximum capacity for liquids or 95 per cent for solids. Bags must only be filled to the maximum mass at which they may be used. For other than bags combination packagings where the inner packaging is designed to carry liquids and solids, separate testing is required for both liquid and solid contents. The substances or articles to be transported in the packaging may be replaced by other substances or articles except where this would invalidate the results of the tests. For solids, when another substance is used it must have the same physical characteristics (mass, grain size, etc.) as the substance to be carried. It is permissible to use additives, such as bags of lead shot, to achieve the requisite total package mass, so long as they are placed so that the test results are not invalidated.

4.2.2 In the drop tests for liquids, when another substance is used, it must be of similar relative density and viscosity to those of the substance being transported. Water may also be used for the liquid drop test under the conditions set forth in 4.3.~~4~~5.

4.2.3 Paper or fibreboard packagings must be conditioned for at least 24 hours in an atmosphere having a controlled temperature and relative humidity (r.h.). There are three options, one of which must be chosen. The preferred atmosphere is 23EC ±2EC and 50 per cent ±2 per cent r.h. The two other options are 20EC ±2EC and 65 per cent ±2 per cent r.h., or 27EC ±2EC and 65 per cent ±2 per cent r.h.

Note.— Average values must fall within these limits. Short-term fluctuations and measurement limitations may cause individual measurements to vary by up to ±5 per cent relative humidity without significant impairment of test reproducibility.

4.2.4 Additional steps must be taken to ascertain that the plastic material used in the manufacture of plastic drums, plastic jerricans and composite packagings (plastic material) intended to contain liquid complies with the provisions in 3.1.7.1, 3.1.7.~~4~~3 and 4;1.1.3. This may be done, for example, by submitting sample receptacles or packagings to a preliminary test extending over a long period, for example six months, during which the samples would remain filled with the substances they are intended to contain, and after which the samples must be submitted to the applicable tests listed in 4.3, 4.4, 4.5 and 4.6. For substances which may cause stress-cracking or weakening in plastic drums or jerricans, the sample, filled with the substance or another substance that is known to have at least as severe a stress-cracking influence on the plastic materials in question, must be subjected to a superimposed load equivalent to the total mass of identical packages which might be stacked on it during transport. The minimum stacking height, including the test sample, must be 3 m.

. . .

4.3 DROP TEST

4.3.1 Number of test samples (per design type and manufacturer) and drop orientation

For other than flat drops the centre of gravity must be vertically over the point of impact. Where more than one orientation is possible for a given drop, the orientation most likely to result in failure of the packaging must be used.

4.3.2 Special preparation of test samples for the drop test

The temperature of the test sample and its contents must be reduced to !18EC or lower for the following packagings:

a) plastic drums (see 3.1.7);

b) plastic jerricans (see 3.1.7);

c) plastic boxes other than expanded polystyrene boxes (see 3.1.12);

d) composite packagings (plastic material) (see 3.1.18); and

e) combination packagings with plastic inner packagings, other than plastic bags intended to contain solids or articles.

Where test samples are prepared in this way, the conditioning specified in 4.2.3 may be waived. Test liquids must be kept in the liquid state by the addition of antifreeze, if necessary.

. . .

4.3.3 Removable head packagings for liquids must not be dropped until at least 24 hours after filling and closing to allow for any possible gasket relaxation.

4.3.3~~4~~4 Target

Editorial Note.— renumber subsequent paragraphs

The target must be a rigid, non-resilient, flat and horizontal surface.

4.3.4~~5~~5 Drop height

For solids and liquids, if the test is performed with the solid or liquid to be transported or with another substance having essentially the same physical characteristics:

Packing Group I	Packing Group II	Packing Group III
1.8 m	1.2 m	0.8 m

For liquids in single packagings and for inner packagings of combination packagings, if the test is performed with water:

a) where the substances to be transported have a relative density not exceeding 1.2:

Packing Group I	Packing Group II	Packing Group III
1.8 m	1.2 m	0.8 m

b) where the substances to be transported have a relative density exceeding 1.2, the drop height must be calculated on the basis of the relative density (d) of the substance to be carried, rounded up to the first decimal, as follows:

Packing Group I	Packing Group II	Packing Group III
d × 1.5 m	d × 1.0 m	d × 0.67 m

Note. — The term water includes water/antifreeze solutions with a minimum specific gravity of 0.95 for testing at -18^0 C

. . .

4.3.56 Criteria for passing the test

4.3.56.1 Each packaging containing liquid must be leakproof when equilibrium has been reached between the internal and external pressures, except for inner packagings of combination packagings when it is not necessary that the pressures be equalized.

4.3.56.2 Where a packaging for solids undergoes a drop test and its upper face strikes the target, the test sample passes the test if the entire contents are retained by an inner packaging or inner receptacle (e.g. a plastic bag), even if the closure while retaining its containment function is no longer sift-proof.

4.3.56.3 The packaging or outer packaging of a composite or combination packaging must not exhibit any damage liable to affect safety during transport. There must be no leakage of the filling substance from the inner receptacle or inner packaging(s).

4.3.56.4 Neither the outermost ply of a bag nor an outer packaging may exhibit any damage liable to affect safety during transport.

4.3.56.5 A slight discharge from the closure(s) upon impact is not considered to be a failure of the packaging provided that no further leakage occurs.

4.3.56.6 No rupture is permitted in packagings for goods of Class 1 which would permit the spillage of loose explosive substances or articles from the outer packaging.

— — — — — — — —

CHAPTER 5 — REQUIREMENTS FOR THE CONSTRUCTION AND TESTING OF CYLINDERS, AEROSOL DISPENSERS AND SMALL RECEPTACLES CONTAINING GAS (GAS CARTRIDGES)

5.1 GENERAL REQUIREMENTS

Note 1. — For aerosol dispensers and small receptacles containing gas (gas cartridges) see 5.4.

Note 2. — For packagings for refrigerated liquefied gases see 5.1.3.6 and 5.5.

5.1.1 Design and construction

5.1.1.1 Cylinders and their closures must be designed, manufactured, tested and equipped in such a way as to withstand all conditions, including fatigue, to which they will be subjected during normal conditions of transport.

5.1.1.2 In recognition of scientific and technological advances, and recognizing that cylinders other than those that are marked with a UN certification marking may be used on a national or regional basis, cylinders conforming to requirements other than those specified in these Instructions may be used if approved by the appropriate national authorities in the countries of transport and use.

5.1.1.3 ~~Any additional thickness used for the purpose of providing a corrosion allowance must not be taken into consideration in calculating the thickness of the walls.~~ In no case must the minimum wall thickness be less than that specified in the design and construction technical standards.

5.1.1.4 For welded cylinders, only metals of weldable quality must be used.

5.1.1.~~6~~ 5 The test pressure of cylinders must be in accordance with packing instruction P200. The test pressure for closed cryogenic receptacles must be in accordance with packing instruction P202.

5.1.1.6 Not used

5.1.1.7 Contact between dissimilar metals which could result in damage by galvanic action must be avoided.

5.1.1.~~5~~8 The following additional requirements apply to the construction of closed cryogenic cylinders for refrigerated liquefied gases~~:~~ .

~~a)~~ 5.1.1.8.1 The mechanical properties of the metal used must be established for each cylinder ~~at the initial inspection,~~ including the impact strength and the bending coefficient;

~~b)~~ 5.1.1.8.2 The cylinders must be thermally insulated. The thermal insulation must be protected against impact by means of ~~continuous sheathing~~ a jacket. If the space between the cylinder and the ~~sheathing~~ jacket is evacuated of air (vacuum-insulation),

the ~~protective sheathing~~ jacket must be designed to withstand without permanent deformation an external pressure of at least 100 kPa (1 bar) calculated in accordance with a recognised technical code or a calculated critical collapsing pressure of not less than 200 kPa (2 bar) gauge pressure. If the ~~sheathing~~ jacket is so closed as to be gas-tight (e.g. in the case of vacuum-insulation), a device must be provided to prevent any dangerous pressure from developing in the insulating layer in the event of inadequate gas-tightness of the cylinder or its fittings. The device must prevent moisture from penetrating into the insulation.

5.1.1.8.3 Closed cryogenic receptacles intended for the transport of refrigerated liquefied gases having a boiling point below -182^0 C at atmospheric pressure must not include materials which may react with oxygen or oxygen enriched atmospheres in a dangerous manner, when located in parts of the thermal insulation where there is a risk of contact with oxygen or oxygen enriched liquid.

5.1.1.8.4 Closed cryogenic receptacles must be designed and constructed with suitable lifting and securing arrangements.

5.1.2 Materials

5.1.2.1 Construction materials of cylinders and their closures which are in direct contact with dangerous goods must not be affected or weakened by the dangerous goods intended and must not cause a dangerous effect e.g. catalysing a reaction or reacting with the dangerous goods.

5.1.2.2 Cylinders and their closures must be made of the materials specified in the design and construction technical standards and the applicable packing instruction for the substances intended for transport in the cylinder. The materials must be resistant to brittle fracture and to stress corrosion cracking as indicated in the design and construction technical standards.

5.1.3 Service equipment

5.1.3.1 Except for pressure relief devices, valves, piping, fittings and other equipment subjected to pressure, must be designed and constructed to withstand at least 1.5 times the test pressure of the cylinders.

5.1.3.2 Service equipment must be configured or designed to prevent damage that could result in the release of the cylinder 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; 4.1.1.~~7~~8.

5.1.3.3 Cylinders which are not capable of being handled manually or rolled, must be fitted with devices (skids, rings, straps) ensuring that they can be safely handled by mechanical means and so arranged as not to impair the strength of, nor cause undue stresses, in the cylinder.

5.1.3.4 Individual cylinders must be equipped with ~~approved~~ pressure relief devices as ~~required~~ specified in packing instruction P200(1) or 5.1.3.6.4 and 5.1.3.6.5. ~~as specified by the country of use~~. Pressure relief devices must be designed to prevent the entry of foreign matter, the leakage of gas and the development of any dangerous excess pressure.

~~5.1.3.5 Not used~~

5.1.3.~~6~~5 Cylinders whose filling is measured by volume must be provided with a level indicator.

5.1.3.5~~6Not used~~.

5.1.4 Initial inspection and test

5.1.4.1 New cylinders, other than closed cryogenic receptacles, must be subjected to testing and inspection during and after manufacture in accordance with the applicable design standards including the following:

On an adequate sample of cylinders:

a) Testing of the mechanical characteristics of the material of construction;

b) Verification of the minimum wall thickness;

c) Verification of the homogeneity of the material for each manufacturing batch~~, and~~;

d) Inspection of the external and internal conditions of the cylinders;

~~(b)~~(e) Inspection of the neck threads;

~~(c)~~(f) Verification of the conformance with the design standard;

For all cylinders:

~~(d)~~(g) A hydraulic pressure test. Cylinders must withstand the test pressure without expansion greater than that allowed in the design specification;

Note. — With the agreement of the ~~inspection body~~ appropriate national authority*, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger.*

~~(g)~~(h) Inspection and assessment of manufacturing defects and either repairing them or rendering the cylinders unserviceable. In the case of welded cylinders, particular attention must be paid to the quality of the welds;

~~(h)~~(i) An inspection of the markings on the cylinders;

~~(i)~~(j) In addition, cylinders intended for the transport of UN 1001 **Acetylene, dissolved**, and UN 3374 **Acetylene, solvent free**, must be inspected to ensure proper installation and condition of the porous ~~material~~ mass and, if applicable, the quantity of solvent.

5.1.4.2 On an adequate sample of closed cryogenic receptacles, the inspections and tests specified in 5.1.4.1 (a), (b), (d) and (f) must be performed. In addition, welds must be inspected by radiographic,

ultrasonic or another suitable non-destructive test method on a sample of closed cryogenic receptacles according to the applicable design and construction standard. This weld inspection does not apply to the jacket.

Additionally, all closed cryogenic receptacles must undergo the inspections and tests specified in 5.1.4.1 (g), (h) and (i), as well as a leakproofness test and a test of the satisfactory operation of the service equipment after assembly.

5.1.5 Periodic inspection and test

5.1.5.1 Refillable cylinders must be subjected to periodic inspections and tests ~~under the supervision of an inspection~~ 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;

(b) Check of the internal conditions of the cylinder (e.g. ~~by weighing~~, internalinspection, ~~checks~~ verification of minimum wall thickness);

(c) Checking of the ~~neck~~ threads if the fittings are removed;

(d) A hydraulic pressure test and, if necessary, verification of the characteristics of the material by suitable tests.

Note 1. — With the agreement of the ~~inspection body~~ appropriate national authority*, the hydraulic pressure test may be replaced by a test using a gas, where such an operation does not entail any danger.*

Note 2. — With the agreement of the appropriate national authority, the hydraulic pressure test of cylinders may be replaced by an equivalent method based on acoustic emission or ultrasound.

5.1.5.2 For cylinders intended for the transport of UN 1001 **Acetylene, dissolved**, and UN 3374 **Acetylene, solvent free**, only the external condition (corrosion, deformation) and the condition of the porous mass (loosening, settlement) must be required to be examined.

~~5.1.5.3 Not used~~

5.1.6 Approval of cylinders

5.1.6.1 The conformity of cylinders must be assessed at time of manufacture as required by the appropriate national authority. Cylinders must be inspected, tested and approved by an inspection body. The technical documentation must include full specifications on design and construction, and full documentation on the manufacturing and testing.

5.1.6.2 Quality assurance systems must conform to the requirements of the appropriate national authority.

5.1.7 Requirements for manufacturers

5.1.7.1 The manufacturer must be technically able and must possess all resources required for the satisfactory manufacture of cylinders; this relates in particular to qualified personnel:

(a) to supervise the entire manufacturing process;

(b) to carry out joining of materials; and

(c) to carry out the relevant tests.

5.1.7.2 The proficiency test of a manufacturer must in all instances be carried out by an inspection body approved by the appropriate national authority of the country of approval.

5.1.8 Requirements for inspection bodies

Inspection bodies must be independent from manufacturing enterprises and competent to perform the tests, inspections and approvals required.

5.2 REQUIREMENTS FOR UN ~~CERTIFIED~~ CYLINDERS

In addition to the general requirements of 5.1, UN ~~certified~~ cylinders must comply with the requirements of this section, including the standards, as applicable.

Note. — With the agreement of the appropriate national authority, more recently published versions of the standards, if available, may be used.

5.2.1 Design, Construction And Initial Inspection And Test

5.2.1.1 The following standards apply for the design, construction, and initial inspection and test of UN ~~certified~~ cylinders, except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5:

ISO 9809-1:1999	Gas cylinders – Refillable seamless steel gas cylinders - Design, construction and testing - Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa *Note. — The note concerning the F factor in section 7.3 of this standard must not be applied for UN ~~certified~~ cylinders.*
ISO 9809-2:2000	Gas cylinders – Refillable seamless steel gas cylinders - Design, construction and testing - Part 2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa
ISO 9809-3:2000	Gas cylinders – Refillable seamless steel gas cylinders - Design, construction and testing - Part 3: Normalized steel cylinders
ISO 7866:1999	Gas cylinders – Refillable seamless aluminium alloy gas cylinders – Design, construction and testing *Note — The note concerning the F factor in section 7.2 of this standard must not be applied for UN ~~certified~~ cylinders. Aluminium alloy*

6351A – T6 or equivalent is must not be authorized.

ISO 11118:1999	Gas cylinders – Non-refillable metallic gas cylinders - Specification and test methods
ISO 11119-1:2002	Gas cylinders of composite construction - Specification and test methods - Part 1: Hoop wrapped composite gas cylinders
ISO 11119-2:2002	Gas cylinders of composite construction - Specification and test methods - Part 2: Fully wrapped fibre reinforced composite gas cylinders with load-sharing metal liners

Note 1. — In the above referenced standards composite cylinders must be designed for unlimited service life.

Note 2. — After the first 15 years of service, composite cylinders manufactured according to these standards, may be approved for extended service by the appropriate national authority which was responsible for the original approval of the cylinders and which will base its decision on the test information supplied by the manufacturer or owner or user.

5.2.1.2 Not used.

5.2.1.3 The following standards apply for the design, construction and initial inspection and test of UN ~~certified~~ acetylene cylinders except that inspection requirements related to the conformity assessment system and approval must be in accordance with 5.2.5.

For the cylinder shell:

ISO 9809-1:1999	Gas cylinders – Refillable seamless steel gas cylinders - Design, construction and testing – Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa *Note. — The note concerning the F factor in section 7.3 of this standard must not be applied for UN ~~certified~~ cylinders* .
ISO 9809-3:2000	Gas cylinders – Refillable seamless steel gas cylinders - Design, construction and testing – Part 3: Normalized steel cylinders
ISO 7866:1999	Gas cylinders – Refillable seamless aluminium alloy gas cylinders – Design, construction and testing *Note. — The note concerning the F factor in section 7.2 of this standard must not be applied for UN ~~certified~~ cylinders. Aluminium alloy 6351A – T6 or equivalent is must not be authorized.*
ISO 11118:1999	Gas cylinders – Non-refillable metallic gas cylinders - Specification and test methods

For the porous mass in the cylinder:

ISO 3807-1:2000	Cylinders for acetylene – Basic requirements - Part 1: Cylinders without fusible plugs
ISO 3807-2:2000	Cylinders for acetylene – Basic requirements - Part 2: Cylinders with fusible plugs

5.2.2 Materials

In addition to the material requirements specified in the cylinder design and construction standards, and any restrictions specified in the applicable packing instruction for the gas(es) to be transported (e.g. packing instruction P200), the following standards apply to material compatibility:

ISO 11114-1:1997	Transportable gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 1: Metallic materials
ISO 11114-2:2000	Transportable gas cylinders – Compatibility of cylinder and valve materials with gas contents – Part 2: Non-metallic materials

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 10297:1999	Gas cylinders –Refillable gas cylinder valves - Specification and type testing.

5.2.4 Periodic inspection and test

The following standards apply to the periodic inspection and testing of UN ~~certified~~ cylinders:

ISO 6406:1992	Periodic inspection and testing of seamless steel gas cylinders
ISO 10461:1993	Seamless aluminium - alloy gas cylinders - Periodic inspection and testing
ISO 10462:1994	Cylinders for dissolved acetylene – Periodic inspection and maintenance
ISO 11623:2002	Transportable gas cylinders - Periodic inspection and testing of composite gas cylinders

5.2.5 Conformity assessment system and approval for manufacture of cylinders

5.2.5.1 *Definitions*

For the purposes of this section:

Conformity assessment system: means a system for appropriate national authority approval of a manufacturer, by cylinder design type approval, approval of manufacturer's quality system and approval of inspection bodies;

Design type: means a cylinder design as specified by a particular cylinder standard;

Verify: means confirm by examination or provision of objective evidence that specified requirements have been fulfilled.

5.2.5.2 *General requirements*

Appropriate National Authority

5.2.5.2.1 The appropriate national authority that approves the cylinder must approve the conformity assessment system for the purpose of ensuring that cylinders conform to the requirements of these Instructions. In instances where the appropriate national authority that approves a cylinder is not the appropriate national authority in the country of manufacture, the marks of the approval country and the country of manufacture must be indicated in the cylinder marking (see 5.2.6 and 5.2.7).

The appropriate national authority of the country of approval must supply, upon request, evidence demonstrating compliance to this conformity assessment system to its counterpart in a country of use.

5.2.5.2.2 The appropriate national authority may delegate its functions in this conformity assessment system in whole or in part.

5.2.5.2.3 The appropriate national authority must ensure that a current list of approved inspection bodies and their identity marks and approved manufacturers and their identity marks is available.

Inspection body

5.2.5.2.4 The inspection body must be approved by the appropriate national authority for the inspection ~~as an inspector~~ of cylinders and must:

a) have a staff with an organisational structure, capable, trained, competent, and skilled, to satisfactorily perform its technical functions;

b) have access to suitable and adequate facilities and equipment;

c) operate in an impartial manner and be free from any influence which could prevent it from doing so;

d) ensure commercial confidentiality of the commercial and proprietary activities of the manufacturer and other bodies;

e) maintain clear demarcation between actual inspection body functions and unrelated functions;

f) operate a documented quality system;

g) ensure that the tests and inspections specified in the relevant cylinder standard and these ~~model regulations~~ Instructions are performed; and

h) maintain an effective and appropriate report and record system in accordance with 5.2.5.6.

5.2.5.2.5 The inspection body must perform design type approval, cylinder production testing and inspection, and certification to verify conformity with the relevant cylinder standard (see 5.2.5.4 and 5.2.5.1).

Manufacturer

5.2.5.2.6 The manufacturer must

a) operate a documented quality system in accordance with 5.2.5.3;

b) apply for design type approvals in accordance with 5.2.5.4;

c) select an inspection body from the list of approved inspection bodies maintained by the appropriate national authority in the country of approval; and

d) maintain records in accordance with 5.2.5.6.

Testing laboratory

5.2.5.2.7 The testing laboratory must have:

a) staff with an organisational structure, sufficient in number, competence, and skill; and

b) suitable and adequate facilities and equipment to perform the tests required by the manufacturing standard to the satisfaction of the inspection body.

5.2.5.3 *Manufacturer's quality system*

5.2.5.3.1 The quality system must contain all the elements, requirements, and provisions adopted by the manufacturer. It must be documented in a systematic and orderly manner in the form of written policies, procedures and instructions.

The contents must in particular include adequate descriptions of:

a) the organisational structure, responsibilities, and power of the management with regard to design and product quality;

b) the design control and design verification techniques, processes, and systematic actions that will be used when designing the cylinders;

c) the relevant cylinder manufacturing, quality control, quality assurance, and process operation instructions that will be used;

d) quality records, such as inspection reports, test data, and calibration data;

e) management reviews to ensure the effective operation of the quality system arising from the audits in accordance with 5.2.5.3.2;

f) the process describing how customer requirements are met;

g) the process for control of documents and their revision;

h) the means for control of non-conforming cylinders, purchased components, in-process and final materials; and

i) training programmes and qualification procedures for relevant personnel.

5.2.5.3.2 Audit of the quality system

The quality system must be initially assessed to determine whether it meets the requirements in 5.2.5.3.1 to the satisfaction of the appropriate national authority.

The manufacturer must be notified of the results of the audit. The notification must contain the conclusions of the audit and any corrective actions required.

Periodic audits must be carried out, to the satisfaction of the appropriate national authority, to ensure that the manufacturer maintains and applies the quality system. Reports of the periodic audits must be provided to the manufacturer.

5.2.5.3.3 *Maintenance of the quality system*

The manufacturer must maintain the quality system as approved in order that it remains adequate and efficient.

The manufacturer must notify the appropriate national authority that approved the quality system, of any intended changes. The proposed changes must be evaluated in order to determine whether the amended quality system will still satisfy the requirements in 5.2.5.3.1.

5.2.5.4 *Approval process*

Initial design type approval

5.2.5.4.1 The initial design type approval must consist of approval of the manufacturer's quality system and approval of the cylinder design to be produced. An application for an initial design type approval must meet ~~encompass~~ the requirements of 5.2.5.3, 5.2.5.4.2 to 5.2.5.4.6 and 5.2.5.4.9.

5.2.5.4.2 A manufacturer desiring to produce cylinders in accordance with a cylinder standard and these Instructions must apply for, obtain, and retain a Design Type Approval Certificate issued by the appropriate national authority in the country of approval for at least one cylinder design type in accordance with the procedure given in 5.2.5.4.9. This certificate ~~written approval~~ must, on request, be submitted to the appropriate national authority of the country of use.

5.2.5.4.3 An application must be made for each manufacturing facility and must include:

a) the name and registered address of the manufacturer and in addition, if the application is submitted by an authorised representative, its name and address;

b) the address of the manufacturing facility (if different from the above);

c) the name and title of the person(s) responsible for the quality system;

d) the designation of the cylinder and the relevant cylinder standard;

e) details of any refusal of approval of a similar application by any other appropriate national authority;

f) the identity of the inspection body for design type approval;

g) documentation on the manufacturing facility as specified under 5.2.5.3.1 and

h) the technical documentation required for design type approval, which must enable verification of the conformity of the cylinders with the requirements of the relevant cylinder design standard. The technical documentation must cover the design and method of manufacture and must contain, as far as is relevant for assessment, at least the following:

i) cylinder design standard, design and manufacturing drawings, showing components and subassemblies, if any;

ii) descriptions and explanations necessary for the understanding of the drawings and intended use of the cylinders;

iii) a list of the standards necessary to fully define the manufacturing process;

iv) design calculations and material specifications; and

v) design type approval test reports, describing the results of examinations and tests carried out in accordance with 5.2.5.4.9.

5.2.5.4.4 An initial audit in accordance with 5.2.5.3.2 must be performed to the satisfaction of the appropriate national authority.

5.2.5.4.5 If the manufacturer is denied approval, the appropriate national authority must provide written detailed reasons for such denial.

5.2.5.4.6 Following approval, changes to the information submitted under 5.2.5.4.~~2~~ 3 relating to the initial approval must be provided to the appropriate national authority.

Subsequent design type approvals

5.2.5.4.7 An application for a subsequent design type approval must encompass the requirements of 5.2.5.4.8 and 5.2.5.4.9, provided a manufacturer is in the possession of an initial design type approval. In such a case, the manufacturer's quality system according to 5.2.5.3 must have been approved during the initial design type approval and must be applicable for the new design.

5.2.5.4.8 The application must include:

a) the name and address of the manufacturer and in addition, if the application is submitted by an authorised representative, its name and address;

b) details of any refusal of approval of a similar application by any other appropriate national authority;

c) evidence that initial design type approval has been granted; and

d) the technical documentation, as described in 5.2.5.4.3 (h).

Procedure for design type approval

5.2.5.4.9 The inspection body must:

a) examine the technical documentation to verify that:

i) the design is in accordance with the relevant provisions of the standard, and

ii) the prototype lot has been manufactured in conformity with the technical documentation and is representative of the design;

b) verify that the production inspections have been carried out as required in accordance with 5.2.5.1;

c) select cylinders from a prototype production lot and supervise the tests of these cylinders as required for design type approval;

d) perform or have performed the examinations and tests specified in the cylinder standard to determine that:

i) the standard has been applied and fulfilled, and

ii) the procedures adopted by the manufacturer meet the requirements of the standard; and

e) ensure that the various type approval examinations and tests are correctly and competently carried out.

After prototype testing has been carried out with satisfactory results and all applicable requirements of 5.2.5.4 have been satisfied, a Design Type Approval Certificate must be issued which must include the name and address of the manufacturer, results and conclusions of the examination, and the necessary data for identification of the design type.

If the manufacturer is denied a design type approval ~~certification~~, the appropriate national authority must provide written detailed reasons for such denial.

5.2.5.4.10 *Modifications to approved design types*

The manufacturer must inform the issuing appropriate national authority of modifications to the approved design type as specified in the cylinder standard. A subsequent design type approval must be requested where such modifications constitute a new design according to the relevant cylinder standard. This additional approval must be given in the form of an amendment to the original Design Type Approval Certificate.

5.2.5.4.11 Upon request, the appropriate national authority must communicate to any other appropriate national authority, information concerning design type approval, modifications of approvals, and withdrawn approvals.

5.2.5.5 *Production inspection and certification*

5.2.5.5.1 An inspection body, or its delegate, must carry out the inspection and certification of each cylinder. The inspection body selected by the manufacturer for inspection and testing during production may be different from the inspection body used for the design type approval testing.

5.2.5.5.2 Where it can be demonstrated to the satisfaction of the inspection body that the manufacturer has trained and competent inspectors, independent of the manufacturing operations, inspection may be performed by those inspectors. In such a case, the manufacturer must maintain training records of the inspectors.

5.2.5.5.3 The inspection body must verify that the inspections by the manufacturer and tests performed on those cylinders, fully conform to the standard and the requirements of these Instructions. Should non-conformance in conjunction with this inspection and testing be determined, the permission to have inspection performed by the manufacturer's inspectors may be withdrawn.

5.2.5.5.4 The manufacturer must, after approval by the inspection body, make a declaration of conformity with the certified design type. The application of the cylinder certification marking must be considered a declaration that the cylinder complies with the applicable cylinder standards and the requirements of this conformity assessment system and these Instructions. The inspection body must affix or delegate the manufacturer to affix the cylinder certification marking and the registered mark of the inspection body to each approved cylinder.

5.2.5.5.5 A certificate of compliance, signed by the inspection body and the manufacturer, must be issued before the cylinders are filled.

5.2.5.6 *Records*

Design type approval and certificate of compliance records must be retained by the manufacturer and the inspection body for not less than 20 years.

5.2.6 Approval System for Periodic Inspection and Test of Cylinders

5.2.6.1 *Definitions*

For the purposes of this section:

Approval system: means a system for appropriate national authority approval of a body performing periodic inspection and test of cylinders (hereinafter referred to as "periodic inspection and test body"), including approval of that body's quality system.

5.2.6.2 *General requirements*

Appropriate national authority

5.2.6.2.1 The appropriate national authority must establish an approval system for the purpose of ensuring that the periodic inspection and test of cylinders conform to the requirements of these Instructions. In instances where the appropriate national authority that approves a body performing periodic inspection and test of a cylinder is not the appropriate national authority of the country approving the manufacture of the cylinder, the marks of the approval country of periodic inspection and test must be indicated in the cylinder marking (see 5.2.7).

The appropriate national authority of the country of approval for the periodic inspection and test must supply, upon request, evidence demonstrating compliance to this approval system including the records of the periodic inspection and test to its counterpart in a country of use.

The appropriate national authority of the country of approval may terminate the approval certificate referred to in 5.2.6.4.1, upon evidence demonstrating non-compliance with the approval system.

5.2.6.2.2 The appropriate national authority may delegate its functions in this approval system, in whole or in part.

5.2.6.2.3 The appropriate national authority must ensure that a current list of approved periodic inspection and test bodies and their identity marks is available.

Periodic inspection and test body

5.2.6.2.4 The periodic inspection and test body must be approved by the appropriate national authority and must:

a) have a staff with an organisational structure, capable, trained, competent, and skilled, to satisfactorily perform its technical functions;

b) have access to suitable and adequate facilities and equipment;

c) operate in an impartial manner and be free from any influence which could prevent it from doing so;

d) ensure commercial confidentiality;

e) maintain clear demarcation between actual periodic inspection and test body functions and unrelated functions;

f) operate a documented quality system accordance with 5.2.6.3;

g) apply for approval in accordance with 5.2.6.4;

h) ensure that the periodic inspections and tests are performed in accordance with 5.2.6.5; and

i) maintain an effective and appropriate report and record system in accordance with 5.2.6.6.

5.2.6.3 Quality system and audit of the periodic inspection and test body

5.2.6.3.1 *Quality system*

The quality system must contain all the elements, requirements, and provisions adopted by the periodic inspection and test body. It must be documented in a systematic and orderly manner in the form of written policies, procedures, and instructions.

The quality system must include:

a) a description of the organisational structure and responsibilities;

b) the relevant inspection and test, quality control, quality assurance, and process operation instructions that will be used;

c) quality records, such as inspection reports, test data, calibration data and certificates;

d) management reviews to ensure the effective operation of the quality system arising from the audits performed in accordance with 5.2.6.3.2;

e) a process for control of documents and their revision;

f) a means for control of non-conforming cylinders; and training programmes and qualification procedures for relevant personnel.

5.2.6.3.2 *Audit*

The periodic inspection and test body and its quality system must be audited in order to determine whether it meets the requirements of these Inst to the satisfaction of the appropriate national authority.

An audit must be conducted as part of the initial approval process (see 5.2.6.4.3). An audit may be required as part of the process to modify an approval (see 5.2.6.4.6).

Periodic audits must be conducted, to the satisfaction of the appropriate national authority, to ensure that the periodic inspection and test body continues to meet the requirements of these Instructions.

The periodic inspection and test body must be notified of the results of any audit. The notification must contain the conclusions of the audit and any corrective actions required.

5.2.6.3.3 *Maintenance of the quality system*

The periodic inspection and test body must maintain the quality system as approved in order that it remains adequate and efficient.

The periodic inspection and test body must notify the appropriate national authority that approved the quality system, of any intended changes, in accordance with the process for modification of an approval in 5.2.6.4.6.

5.2.6.4 *Approval process for periodic inspection and test bodies*

Initial approval

5.2.6.4.1 A body desiring to perform periodic inspection and test of cylinders in accordance with a cylinder standard and these Instructions must apply for, obtain, and retain an Approval Certificate issued by the appropriate national authority.

This written approval must, on request, be submitted to the appropriate national authority of a country of use.

5.2.6.4.2 An application must be made for each periodic inspection and test body and must include:

a) the name and address of the periodic inspection and test body and, if the application is submitted by an authorised representative, its name and address;

b) the address of each facility performing periodic inspection and test;

c) the name and title of the person(s) responsible for the quality system;

d) the designation of the cylinders, the periodic inspection and test methods, and the relevant cylinder standards encompassed by the quality system;

e) documentation on each facility, the equipment, and the quality system as specified under 5.2.6.3.1;

f) the qualifications and training records of the periodic inspection and test personnel; and

g) details of any refusal of approval of a similar application by any other appropriate national authority.

5.2.6.4.3 The appropriate national authority must:

a) examine the documentation to verify that the procedures are in accordance with the requirements of the relevant cylinder standards and these Instructions; and

b) conduct an audit in accordance with 5.2.6.3.2 to verify that the inspections and tests are carried out as required by the relevant cylinder standards and these Instructions, to the satisfaction of the appropriate national authority.

5.2.6.4.4 After the audit has been carried out with satisfactory results and all applicable requirements of 5.2.6.4 have been satisfied, an Approval Certificate must be issued. It must include the name of the periodic inspection and test body, the registered mark, the address of each facility, and the necessary data for identification of its approved activities (e.g. designation of cylinders, periodic inspection and test method and cylinder standards).

5.2.6.4.5 If the periodic inspection and test body is denied approval, the appropriate national authority must provide written detailed reasons for such denial.

Modifications to periodic inspection and test body approvals

5.2.6.4.6 Following approval, the periodic inspection and test body must notify the issuing appropriate national authority of any modifications to the information submitted under 5.2.6.4.2 relating to the initial approval.

The modifications must be evaluated in order to determine whether the requirements of the relevant cylinder standards and these Instructions will be satisfied.

An audit in accordance with 5.2.6.3.2 may be required.

The appropriate national authority must accept or reject these modifications in writing, and an amended Approval Certificate must be issued as necessary.

5.1.1.5.3.7 Upon request, the appropriate national authority must communicate to any other appropriate national authority, information concerning initial approvals, modifications of approvals, and withdrawn approvals.

5.2.6.5 *Periodic inspection and test and certification*

The application of the periodic inspection and test marking to a cylinder must be considered a declaration that the cylinder complies with the applicable cylinder standards and the requirements of these Instructions. The periodic inspection and test body must affix the periodic inspection and test marking, including its registered mark, to each approved cylinder (see 5.2.7.7).

A record certifying that a cylinder has passed the periodic inspection and test must be issued by the periodic inspection and test body, before the cylinder is filled.

5.2.6.6 *Records*

The periodic inspection and test body must retain records of cylinder periodic inspection and tests (both passed and failed) including the location of the test facility, for not less than 15 years.

The owner of the cylinder must retain an identical record until the next periodic inspection and test unless the cylinder is permanently removed from service.

Editorial Note.— renumber subsequent paragraphs

5.2.6 7...Marking of ~~UN certified~~ refillable UN cylinders

~~UN certified~~ rRefillable UN cylinders must be marked clearly and legibly with certification, operational and manufacturing marks. ~~and gas or cylinder specific marks.~~ These marks must be permanently affixed (e.g. stamped, engraved, or etched) on the cylinder. The marks must be on the shoulder, top end or neck of the cylinder or on a permanently affixed component of the cylinder (e.g. welded collar or corrosion resistant plate welded to the outer jacket of a closed cryogenic receptacle). Except for the ~~"UN" mark~~ UN packaging symbol, the minimum size of the marks must be 5mm for cylinders with a diameter greater than or equal to 140 mm and 2.5 mm for cylinders with a diameter less than 140 mm. The minimum size of the ~~"UN" mark~~ UN packaging symbol, must be 10 mm for cylinders with a diameter greater than or equal to 140 mm and 5 mm for cylinders with a diameter less than 140 mm.

5.2.6.7.1 The following certification marks must be applied:

a) The UN packaging symbol

This symbol must only be marked on cylinders which conform to the requirements of these Instructions for UN ~~certified~~ cylinders.

b) The technical standard (e.g. ISO 9809-1) used for design, construction and testing;

c) The character(s) identifying the country of approval as indicated by the distinguishing signs of motor vehicles in international traffic;

d) The identity mark or stamp of the inspection body that is registered with the appropriate national authority of the country authorizing the marking;

e) The date of the initial inspection, the year (four digits) followed by the month (two digits) separated by a slash (i.e. "/").

5.2.6.7.2 The following operational marks must be applied:

f) The test pressure in bar, preceded by the letters "PH" and followed by the letters "BAR";

g) The ~~empty~~ mass of the empty cylinder including all permanently attached integral parts (e.g. neck ring, foot ring, etc.) in kilograms, followed by the letters "KG". This mass must not include the mass of valve, valve cap or valve guard, any coating, or porous mass for acetylene. The ~~empty~~ mass must be expressed to three significant figures rounded up to the last digit. For cylinders of less than 1 kg, the mass must be expressed to two significant figures rounded up to the last digit;

h) The minimum guaranteed wall thickness of the cylinder in millimetres followed by the letters "MM". This mark is not required for cylinders with a water capacity less than or equal to 1 litre or for composite cylinders or for closed cryogenic receptacles;

i) In the case of cylinders ~~intended~~ for ~~the transport of~~ compressed gases, UN 1001 **Acetylene, dissolved**, and UN 3374 **Acetylene, solvent free**, the working pressure in bar, preceded by the letters "PW". In the case of closed cryogenic receptacles, the maximum allowable working pressure preceded by the letters “MAWP”;

j) In the case of cylinders for liquefied gases and refrigerated liquefied gases, the water capacity in litres expressed to three significant ~~digits~~ figures rounded down to the last digit, followed by the letter "L". If the value of the minimum or nominal water capacity is an integer, the digits after the decimal point may be neglected;

k) In the case of cylinders for UN 1001 **Acetylene, dissolved**, the total of the mass of the empty receptacle, the fittings and accessories not removed during filling, the porous ~~material~~ mass, the solvent and the saturation gas expressed to two significant figures rounded down to the last digit followed by the letters "KG";

l) In the case of cylinders for UN 3374 **Acetylene, solvent free**, the total of the mass of the empty receptacle, the fittings and accessories not removed during filling and the porous ~~material~~ mass expressed to two significant figures rounded down to the last digit followed by the letters "KG".

5.2.~~6~~.7.3 The following manufacturing marks must be applied

m) Identification of the cylinder thread (e.g. 25E). This mark is not required for closed cryogenic receptacles;

n) The manufacturer's mark registered by the appropriate national authority. When the country of manufacture is not the same as the country of approval, then the manufacturer's mark must be preceded by the character(s) identifying the country of manufacture as indicated by the distinguishing signs of motor vehicles in international traffic. The country mark and the manufacturer's mark must be separated by a space or slash;

o) The serial number assigned by the manufacturer;

p) In the case of steel cylinders and composite cylinders with steel liner intended for the transport of gases with a risk of hydrogen embrittlement, the letter "H" showing compatibility of the steel (see 1SO 11114-1:1997).

5.2.6.7.4 The above marks must be placed in three groups ~~as shown in the example below.~~

- Manufacturing marks must be the top grouping and must appear consecutively in the sequence given in 5.2.~~6~~ .7.3.

- The operational marks in 5.1.2.7.2 must be the middle grouping ~~must include~~ and the test pressure f) which must be immediately preceded by the working pressure (i) when the latter is required.

- Certification marks must be the bottom grouping and must appear in the sequence given in 5.2.6.7.1.

The following is an example of the markings applied to a cylinder.

(m) **25E**	(n) **D MF**	(o) **765432**	(p) **H**	
(i) **PW200PH**	(f) **300BAR**	(g) **62.1KG**	(j) **50L**	(h) **5.8MM**
(a) 	(b) **ISO 9809-1**	(c) **F**	(d) **IB**	(e) **2000/12**

5.2.6 7.5 Other marks are allowed in areas other than the side wall, provided they are made in low stress areas and are not of a size and depth that will create harmful stress concentrations. In the case of closed cryogenic receptacles, such marks may be on a separate plate attached to the outer jacket. Such marks must not conflict with required marks.

5.2.7.6 Cylinders of composite construction with limited life must be marked with the letters “FINAL” followed by the expiry date year (four digits) and month (two digits).

5.2.6 7.7 In addition to the preceding marks, each refillable cylinder that meets the periodic inspection and test requirements of 5.2.4 must be marked indicating: ~~the date (year and month) of the last periodic inspection and the registered mark of the inspection body authorized by the appropriate national authority of the country of use.~~

a) the character(s) identifying the country authorizing the body performing the periodic inspection and test. This marking is not required if this body is approved by the appropriate national authority of the country approving manufacture;

b) the registered mark of the body authorised by the appropriate national authority for performing periodic inspection and test;

c) the date of the periodic inspection and test, the year (two digits) followed by the month (two digits) separated by a slash (i.e.“/”). Four digits may be used to indicate the year.

The above marks must appear consecutively in the sequence given.

5.2. ~~7~~.8 Marking of ~~UN certified~~ non-refillable UN cylinders

5.2. ~~7~~.8.1 ~~UN certified n~~ Non-refillable UN cylinders must be marked clearly and legibly with certification and gas or cylinder specific marks. These marks must be permanently affixed (e.g. stencilled, stamped, engraved, or etched) on the cylinder. Except when stencilled, the marks must be on the shoulder, top end or neck of the cylinder or on a permanently affixed component of the cylinder (e.g. welded collar). Except for the "UN" mark and the "DO NOT REFILL" mark, the minimum size of the marks must be 5mm for cylinders with a diameter greater than or equal to 140 mm and 2.5 mm for cylinders with a diameter less than 140 mm. The minimum size of the "UN" mark must be 10mm for cylinders with a diameter greater than or equal to 140 mm and 5mm for cylinders with a diameter less than 140 mm. The minimum size of the "DO NOT REFILL" mark must be 5 mm.

5.2. ~~7~~.8.2 The marks listed in 5.2.6.1 to 5.2.6.3 must be applied with the exception of (g), (h), and (m). The serial number (o) may be replaced by the batch number. In addition, the words "DO NOT REFILL" in letters of at least 5 mm in height are required.

5.2. ~~7~~.8.3 The requirements of 5.2.6.4 must apply.

Note. — Non-refillable cylinders may, on account of their size, substitute this marking by a label ~~(see 5.2.2.2.1.2)~~.

5.2. ~~7~~.8.4 Other marks are allowed provided they are made in low stress areas other than the side wall and are not of a size and depth that will create harmful stress concentrations. Such marks must not conflict with required marks.

5.3 REQUIREMENTS FOR NON-UN ~~CERTIFIED~~ CYLINDERS

5.3.1 Cylinders not designed, constructed, inspected, tested and approved according to the requirements of 5.2 must be designed, constructed, inspected, tested and approved in accordance with the provisions of a technical code recognised by the appropriate national authority and the general requirements of 5.1.

5.3.2 Cylinders designed, constructed, inspected, tested and approved under the provisions of this section must not be marked with the UN packaging symbol.

5.3.3 For metallic cylinders, tubes, pressure drums and bundles of cylinders, the construction must be such that the minimum burst ratio (burst pressure divided by test pressure) is:

1.50 for refillable cylinders,
2.00 for non-refillable cylinders.

5.3.4 Marking must be in accordance with the requirements of the appropriate national authority of the country of use.

— — — — — — — —

CHAPTER 7 — REQUIREMENTS FOR THE CONSTRUCTION, TESTING AND APPROVAL OF PACKAGES AND MATERIAL OF CLASS 7

. . .

7.2 ADDITIONAL REQUIREMENTS FOR PACKAGES TRANSPORTED BY AIR

7.2.1 The temperature of the accessible surfaces must not exceed 50EC at an ambient temperature of 38EC with no account taken for insolation.

7.2.2 Packages must be designed so that, if they were exposed to ambient temperatures ranging from !40EC to +55EC, the integrity of the containment would not be impaired.

7.2.3 Packages containing radioactive material must be capable of withstanding, without leakage, an internal pressure that produces a pressure differential of not less than maximum normal operating pressure plus 95 kPa.

. . .

7.4 REQUIREMENTS FOR INDUSTRIAL PACKAGES

7.4.1 Industrial packages Types 1, 2 and 3 (Types IP-1, IP-2 and IP-3) must meet the requirements specified in 7.1, 7.2 and 7.6.2.

7.4.2 ~~An Industrial~~ A Type IP-2 package ~~Type 2 (Type IP-2)~~ must, if it were subjected to the tests specified in 7.14.4 and 7.14.5, prevent:

a) loss or dispersal of the radioactive contents; and

b) loss of shielding integrity which would result in more than a 20 per cent increase in the radiation level at any external surface of the package.

7.4.3 An ~~Industrial~~ A Type IP-3 package Type 3 (Type IP-3) must meet all the requirements specified in 7.6.2 to 7.6.15.

. . .

7.4.4 ALTERNATIVE REQUIREMENTS FOR INDUSTRIAL PACKAGES Types 2 and 3 (Types IP-2 and IP-3)

7.4.4.1 Packages may be used as ~~Industrial~~ Type IP-2 package ~~Type 2 (Type IP-2)~~, provided that:

a) they satisfy the requirements of 7.4.1;

b) they are designed to conform to the standards prescribed in Part 6, Chapter 3 or other requirements at least equivalent to those standards; and

c) when subjected to the tests required for Packing Group I or II in Part 6, Chapter 4, they would prevent:

i) loss or dispersal of the radioactive contents; and

ii) loss of shielding integrity which would result in more than a 20 per cent increase in the radiation level at any external surface of the package.

. . .

7.5 REQUIREMENTS FOR PACKAGES CONTAINING URANIUM HEXAFLUORIDE

7.5.1 Packages designed to contain uranium hexafluoride must meet the requirements prescribed elsewhere in these Instructions which pertain to the radioactive and fissile properties of the material. Except as allowed in 7.5.4, uranium hexafluoride in quantities of 0.1 kg or more must also be packaged and transported in accordance with the provisions of ISO 7195:1993: "Packaging of uranium hexafluoride (UF_6) for transport", and the requirements of 7.5.2 and 7.5.3. The package must also meet the requirements prescribed elsewhere in these Instructions, which pertain to the radioactive and fissile properties of the material.

7.5.2 Each package designed to contain 0.1 kg or more of uranium hexafluoride must be designed so that it would meet the following requirements:

a) withstand, without leakage and without unacceptable stress, as specified in ISO 7195:1993, the structural test as specified in 7.1.1;

b) withstand, without loss or dispersal of the uranium hexafluoride, the free drop test specified in 7.14.4; and

c) withstand, without rupture of the containment system, the thermal test specified in 7.16.3.

7.5.3 Packages designed to contain 0.1 kg or more of uranium hexafluoride must not be provided with pressure relief devices.

7.5.4 Subject to the approval of the competent authority, packages designed to contain 0.1 kg or more of uranium hexafluoride may be transported if:

a) the packages are designed to international or national standards ~~meet requirements~~ other than ~~those given in~~ ISO 7195:1993 ~~and 7.5.2 and 7.5.3 but, notwithstanding, the requirements of 7.5.2 and 7.5.3 are met as far as practicable~~ provided an equivalent level of safety is maintained;

b) the packages are designed to withstand, without leakage and without unacceptable stress, a test pressure of less than 2.76 MPa, as specified in 7.1.1.

(c) For packages designed to contain 9 000 kg or more of uranium hexafluoride, the packages do not meet the requirement of 7.5.2 c).

In all other respects the requirements specified in 7.5.1 to 7.5.3 must be satisfied.

. . .

7.6.16 Type A packages to contain liquids

A Type A package designed to contain liquids must, in addition:

a) be adequate to meet the conditions specified in 7.6.14(a) if the package is subjected to the tests specified in 7.15; and

b) either

i) be provided with sufficient absorbent material to absorb twice the volume of the liquid contents. Such absorbent material must be suitably positioned so as to contact the liquid in the event of leakage; or

ii) be provided with a containment system composed of primary inner and secondary outer containment

Table 6-4. Insolation data

Case	*Form and location of surface*	*Insolation for 12 hours per day* *(W/m²)*
1	Flat surfaces transported horizontally: - downward facing	~~none~~ 0
2	— ~~base~~ Flat surfaces transported horizontally upward facing — ~~other surfaces~~	800
3	~~Flat~~ Surfaces ~~not~~ transported ~~horizontally:~~ vertically — ~~each surface~~	200*
4	Other downward facing (not horizontal) surfaces	200*
5	~~Curved~~ All other surfaces	400*

*Alternatively, a sine function may be used, with an absorption coefficient adopted and the effects of possible reflection from neighbouring objects neglected.

7.10 REQUIREMENTS FOR PACKAGES CONTAINING FISSILE MATERIAL

7.10.1 Fissile material must be transported so as to:

a) maintain subcriticality during normal and accident conditions of transport; in particular, the following contingencies must be considered:

i) water leaking into or out of packages;

ii) the loss of efficiency of built-in neutron absorbers or moderators;

iii) rearrangement of the contents either within the package or as a result of loss from the package;

iv) reduction of spaces within or between packages;

v) packages becoming immersed in water or buried in snow; and

vi) temperature changes; and

b) meet the requirements:

i) of 7.6.2 for ~~fissile material contained in~~ packages containing fissile material~~;~~

ii) prescribed elsewhere in these Instructions and which pertain to the radioactive properties of the material; and

iii) specified in 7.10.3 to 7.10.12, unless excepted by 7.10.2.

7.10.2 Fissile material meeting one of the provisions in a) to d) below is excepted from the requirement to be transported in packages that comply with 7.10.3 to 7.10.12, as well as the other requirements of these Instructions that apply to fissile material. Only one type of exception is allowed per consignment:

a) A mass limit per consignment such that:

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

where X and Y are the mass limits defined in Table 6-5, provided that either:

i) each individual package contains not more than 15 g of fissile material;

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

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

Neither beryllium nor deuterium in hydrogeneous material enriched in deuterium must be present in quantities exceeding ~~0.1% of the fissile material mass~~ 1% of the applicable consignment mass limits provided in Table 6-5.

b) Uranium enriched in uranium-235 to a maximum of 1% by mass, and with a total plutonium and uranium-233 content not exceeding 1% of the mass of uranium-235,

provided that the fissile material is distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it must not form a lattice arrangement;

. . .

7.10.5 The ~~packaging~~ package, after being subjected to the tests specified in 7.14, must prevent the entry of a 10 cm cube.

. . .

7.10.10 (a) The package must be subcritical under conditions consistent with the Type C package tests ~~prescribed~~ specified in 7.19.1 assuming reflection by at least 20 cm of water but no water in leakage.

(b) In the assessment of 7.10.9, a ~~A~~llowance must not be made for special features of 7.10.7 unless, following the Type C package tests specified in 7.19.1 and, subsequently, the water inleakage test of 7.18.3, leakage of water into or out of the void spaces is prevented.

. . .

7.13 TARGET FOR DROP TESTS

The target for the drop tests specified in 2;7.4.5 a), 7.14.4, 7.15 a), 7.16.2, and 7.19.2 ~~and 7.19.4~~ must be a flat, horizontal surface of such a character that any increase in its resistance to displacement or deformation upon impact by the specimen would not significantly increase the damage to the specimen.

. . .

7.16 TESTS FOR DEMONSTRATING THE ABILITY TO WITHSTAND ACCIDENT CONDITIONS IN TRANSPORT

7.16.1 The specimen must be subjected to the cumulative effects of the tests specified in 7.16.2 and 7.16.3, in that order. Following these tests, either this specimen or a separate specimen must be subjected to the effect(s) of the water immersion test(s) as specified in 7.16.4 and, if applicable, 7.17.

7.16.2 Mechanical test: the mechanical test consists of three different drop tests. Each specimen must be subjected to the applicable drops as specified in 7.7.7 or 7.10.12. The order in which the specimen is subjected to the drops must be such that, on completion of the mechanical test, the specimen must have suffered such damage as will lead to the maximum damage in the thermal test which follows:

a) For drop I, the specimen must drop onto the target so as to suffer the maximum damage, and the height of the drop measured from the lowest point of the specimen to the upper surface of the target must be 9 m. The target must be as defined in 7.13;

b) For drop II, the specimen must drop so as to suffer the maximum damage onto a bar rigidly mounted perpendicularly on the target. The height of the drop measured from the

intended point of impact of the specimen to the upper surface of the bar must be 1 m. The bar must be of solid mild steel of circular section, (15.0 ± 0.5 cm) in diameter and 20 cm long unless a longer bar would cause greater damage, in which case a bar of sufficient length to cause maximum damage must be used. The upper end of the bar shall be flat and horizontal with its ~~edges~~ edge rounded off to a radius of not more than 6 mm. The target on which the bar is mounted shall be as described in 7.13;

. . .

7.17 ENHANCED WATER IMMERSION TEST FOR TYPE B(U) AND TYPE B(M) PACKAGES CONTAINING MORE THAN 10^5 A_2, AND TYPE C PACKAGES

. . .

7.19 TESTS FOR TYPE C PACKAGES

7.19.1 Specimens must be subjected to the effects of each of the following test sequences in the orders specified:

a) the tests specified in 7.16.2 a), 7.16.2 c), 7.19.2 and 7.19.3; and

b) the test specified in 7.19.4.

Separate specimens are allowed to be used for each of the sequences in a) and b).

7.19.2 Puncture/tearing test: the specimen must be subjected to the damaging effects of a solid probe made of mild steel. The orientation of the probe to the surface of the specimen must be positioned so as to cause maximum damage at the conclusion of the test sequence specified in 7.19.1 a).

a) The specimen, representing a package having a mass less than 250 kg, must be placed on a target and subjected to a probe having a mass of 250 kg and falling from a height of 3 m above the intended impact point. For this test, the probe must be a 20 cm diameter cylindrical bar with the striking end forming a frustum of a right circular cone with the following dimensions: 30 cm height and 2.5 cm in diameter at the top with its edge rounded off to a radius of not more than 6 mm. The target on which the specimen is placed must be as specified in 7.13;

b) For packages having a mass of 250 kg or more, the base of the probe must be placed on a target and the specimen dropped onto the probe. The height of the drop, measured from the point of impact with the specimen to the upper surface of the probe must be 3 m. For this test, the probe must have the same properties and dimensions as specified in a) above, except that the length and mass of the probe must be such as to incur maximum damage to the specimen. The target on which the base of the probe is placed must be as specified in 7.13.

7.19.3 Enhanced thermal test: the conditions for this test must be as specified in 7.16.3, except that the exposure to the thermal environment must be for a period of 60 minutes.

7.19.4 Impact test: the specimen must be subject to an impact on a target at a velocity of not less than 90 m/s, at such an orientation as to suffer maximum damage. The target must be as defined in 7.13, except that the target surface may be at any orientation as long as the surface is normal to the specimen path.

— — — — — — — —

PART 7 — OPERATOR'S RESPONSIBILITIES

CHAPTER 1 — ACCEPTANCE PROCEDURES

1.1 ACCEPTANCE OF DANGEROUS GOODS BY OPERATORS

. . .

~~c) when these Instructions require the use of packagings bearing UN Specification Markings or Type A or B packagings for radioactive material, the statement "Inner packages comply with prescribed specifications" appears on an overpack used to enclose these packages unless such markings are visible;~~ and

c)~~d)~~ proper shipping names, UN numbers, labels, "limited quantities" (when applicable) and special handling instructions appearing on the interior package(s) are clearly visible or reproduced on the outside of the overpack.

With regard to freight containers containing radioactive materials, the operator must ensure that all four sides of the container are correctly labelled.

. . .

1.1.2 An operator must not accept for transport aboard aircraft a package or overpack containing dangerous goods or a freight container containing radioactive material or a unit load device or other type of pallet containing the dangerous goods as described in 1.1.1 b) and c) unless it is accompanied by two copies of the dangerous goods transport document or, where permitted, by the alternative documentation. One copy of the document must accompany the consignment to final destination and one copy must be retained by the operator at a location on the ground where it will be possible to obtain access to it within a reasonable period; the document must be retained at this point until the goods have arrived at final destination, after which time it may be stored elsewhere. The operator must also not accept the package, overpack, freight container or a unit load device mentioned above unless he has inspected it, found it to be properly marked and labelled and determined that there is no leakage or other indication that its integrity has been compromised. With regard to overpacks and the packages they contain, the operator must take all reasonable steps to establish that:

a) the package or overpack does not contain packages of dangerous goods which require segregation according to Table 7-1;

b) the overpack does not contain packages bearing the "Cargo aircraft only" label unless:

1) the packages are assembled in such a way that clear visibility and easy access to them is possible; or

2) the packages are not required to be accessible under Part 7;2.4.1; or

3) not more than one package is involved;

c) when these Instructions require the use of packagings bearing UN Specification Markings or Type A or B packagings for radioactive material, the statement "Inner packages comply with prescribed specifications" appears on an overpack used to enclose these packages unless such markings are visible; and

d) proper shipping names, UN numbers, labels, "limited quantities" (when applicable) and special handling instructions appearing on the interior package(s) are clearly visible or reproduced on the outside of the overpack.

With regard to freight containers containing radioactive materials, the operator must ensure that all four sides of the container are correctly labelled.

Note. — Minor discrepancies, such as the omission of dots and commas in the proper shipping name appearing on the transport documents or on package markings are not considered as errors if they do not compromise safety and should not be considered as reason for rejecting a consignment.

. . .

1.2 SPECIAL RESPONSIBILITIES IN ACCEPTING INFECTIOUS SUBSTANCES

~~1.2.1.1 Dispatch of infectious substances must not take place before advance arrangements have been made between the shipper and the operator.~~

~~1.2.1.2 The operator must accept and expedite the transport of those consignments which meet applicable requirements. If the operator finds any error in the labelling or documentation, he must immediately notify the shipper or consignee so that the appropriate corrective measures can be taken.~~

~~1.2.3~~ Routing

Whatever the mode used, transport must be made by the quickest possible routing. If trans-shipment is necessary, precautions must be taken to ensure special care, expeditious handling and monitoring of the substances in transit.

. . .

1.3 ACCEPTANCE CHECKLIST

To assist in carrying out their responsibilities with respect to the acceptance of dangerous goods, operators must use a checklist. This checklist must include all reasonable steps to establish that:

. . .

c) the requirements of 1.1.2 have been fulfilled.

Note. — A checklist is not required for dangerous goods in excepted quantities and radioactive material in excepted packages.

— — — — — — — —

CHAPTER 2 — STORAGE AND LOADING

. . .

2.8 STOWAGE OF TOXIC AND INFECTIOUS SUBSTANCES

Substances of Class 6 (toxic and category A infectious substances) and substances requiring a subsidiary risk "Toxic" label must not be carried in the same compartment of an aircraft with animals, substances marked as or known to be foodstuffs, feeds or other edible substances intended for consumption by humans or by animals, unless either the toxic or category A infectious substances and the foodstuffs or animals are loaded in separate unit load devices and when stowed aboard the aircraft the unit load devices are not adjacent to each other, or the toxic or category A infectious substances are loaded in one closed unit load device and the foodstuffs or animals are loaded in another closed unit load device.

2.9 SPECIAL PROVISIONS APPLICABLE TO THE CARRIAGE OF RADIOACTIVE MATERIAL

. . .

2.9.3 Stowage during transport and storage in transit

. . .

2.9.3.3 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 7-3. For consignments of LSA-I material, there ~~must be~~ is no limit on the sum of the transport indexes;

b) Where a consignment is transported under exclusive use, there ~~must be~~ is no limit on the sum of the transport indexes aboard a single aircraft;

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 7-4.

. . .

2.9.4 Segregation of packages containing fissile material during transport and storage in transit

2.9.4.1 Any group of ~~The number of~~ packages, overpacks and freight containers containing fissile material stored in transit in any one storage area must be so limited that the total sum of the criticality safety indexes in ~~any group of such packages, overpacks or freight containers~~ the group does not exceed 50. ~~Groups of such packages, overpacks and freight containers must be~~ Each group must be stored so as to maintain a spacing of at least 6 m from other such groups ~~of such packages, overpacks or freight containers~~.

2.9.4.2 Where the total sum of the criticality safety indexes on board an aircraft or in a freight container exceeds 50, as permitted in Table 7-4, 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.

— — — — — — — —

CHAPTER 3 — INSPECTION AND DECONTAMINATION

3.1 INSPECTION FOR DAMAGE OR LEAKAGE

3.1.1 It is the operator's responsibility to ensure that a package or overpack containing dangerous goods is not loaded onto an aircraft or into a unit load device unless it has been inspected immediately prior to loading and found free from evidence of leakage or damage.

3.1.2 A unit load device must not be loaded aboard an aircraft unless the device has been inspected and found free from any evidence of leakage from or damage to any dangerous goods contained therein.

3.1.3 Packages or overpacks containing dangerous goods must be inspected for signs of damage or leakage upon unloading from the aircraft or unit load device. If evidence of damage or leakage is found, the position where the dangerous goods or unit load device was stowed on the aircraft must be inspected for damage or contamination and any hazardous contamination removed. The special responsibilities of operators regarding infectious substances are detailed in 3.1.4 and 3.1.5.

3.1.4 If any person responsible for the carriage ~~or opening~~ of packages containing infectious substances becomes aware of damage to or leakage from such a package, that person must:

a) avoid handling the package or keep handling to a minimum;

b) inspect adjacent packages for contamination and put aside any that may have been contaminated;

c) inform the appropriate public health authority or veterinary authority, and provide information on any other countries of transit where persons may have been exposed to danger;

d) notify the ~~consignor~~ shipper and/or the consignee.

— — — — — — — —

CHAPTER 4 — PROVISION OF INFORMATION

4.1 INFORMATION TO THE PILOT-IN-COMMAND

. . .

4.1.1 b) the proper shipping name…….as listed in these Instructions. When chemical oxygen generators contained in Protective Breathing Equipment (PBE) are being transported under Special Provision A144, the proper shipping name of "oxygen generator, chemical" must be supplemented with the statement "Air crew Protective Breathing Equipment (smoke hood) in accordance with Special Provision A144".

4.2 INFORMATION TO EMPLOYEES

An operator must provide such 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. This information must include instructions as to the action to be taken in the event of emergencies involving dangerous goods, and details of the location and numbering system of cargo compartments together with: ~~the maximum total sum of transport indexes of radioactive material permitted in each compartment~~

a) the maximum quantity of dry ice permitted in each compartment; and

b) if radioactive material is to be carried instructions on the loading of such dangerous goods, based on the requirements of 7;2.9.

Where applicable, this information must also be provided to ground handling agents.

. . .

4.6 INFORMATION BY THE OPERATOR IN CASE OF AN AIRCRAFT ACCIDENT OR INCIDENT

4.6.1 In the event of an aircraft accident or serious incident, the operator of an aircraft carrying dangerous goods as cargo must provide information, without delay, to emergency services responding to the accident or serious incident about the dangerous goods on board, as shown on the copy of the information to the pilot-in-command. As soon as possible, the operator must also provide this information to the appropriate authorities of the State of the Operator and the State in which the accident or serious incident occurred.

4.6.2 In the event of an aircraft incident, the operator of an aircraft carrying dangerous goods as cargo must, if requested to do so, provide information without delay to the emergency services responding to the incident and to the appropriate authority of the State in which the incident occurred, about the dangerous goods on board, as shown on the copy of the information to the pilot-in-command.

Note ~~1~~.— The terms "accident", "serious incident" and "incident" are as defined in Annex 13.

~~*Note 2.— Operators must address the provisions of 4.6.1 and 4.6.2 in appropriate manuals and accident contingency plans.*~~

4.6.3 Operators must address the provisions of 4.6.1 and 4.6.2 in appropriate manuals and accident contingency plans.

— — — — — — — —

CHAPTER 5 — PROVISIONS CONCERNING PASSENGERS AND CREW

5.1 INFORMATION TO PASSENGERS

5.1.1 Each operator and airport operator must ensure that information is promulgated in such a manner that passengers are warned as to the types of dangerous goods which they are forbidden from transporting aboard an aircraft as provided for in 5.1.2.

— — — — — — — —

PART 8 — PROVISIONS CONCERNING PASSENGERS AND CREW

CHAPTER 1 — PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

. . .

1.1.2 The provisions of these Instructions do not apply to the following when carried by passengers or crew members or in baggage, transported by the operator, that has been separated from its owner during transit (e.g. lost baggage or improperly routed baggage):

. . .

d) small ~~carbon dioxide gas~~ cylinders of a gas of division 2.2 worn for the operation of mechanical limbs, also spare cylinders of a similar size if required to ensure an adequate supply for the duration of the journey.

e) with the approval of the operator(s), as checked baggage only, securely ~~boxed~~ packaged cartridges, (UN 0012 or UN0014 only), ~~for sporting purposes,~~ in Division 1.4S, in quantities not exceeding 5 kg gross mass per person for that person's own use, excluding ammunition with explosive or incendiary projectiles. Allowances for more than one person must not be combined into one or more packages;

— — — — — — — —

AMENDMENTS TO THE SUPPLEMENT

PART S-7— STATE'S RESPONSIBILITIES

CHAPTER 2 — STORAGE AND LOADING

. . .

2.2 LOADING ON PASSENGER AIRCRAFT

. . .

2.2.2 The dangerous goods may only be in the following classes or divisions:

Division 1.4S

Division 2.1 Aerosols only

Division 2.2
(except UN 2037, UN 2073 and UN 2857)

Class 3
(except UN 1112, UN 2047, UN 2059, UN 2332, UN 3054, and UN 3269)

Division 4.1
(except UN 1309, UN 1313, UN 1314, UN 1318, UN 1324, UN 1330, UN 1338, UN 1353, UN 1869, UN 2000, UN 2213, UN 2714, UN 2715, UN 2878, UN 3089, and UN 3241)

Division 5.1
(except UN 1458, UN 1459, UN 1467, UN 1481, UN 1482, UN 1483, UN 2427, UN 2428, UN 2429, UN 2469, UN 2726, UN 2984, UN 3210, UN 3211, UN 3213, UN 3215, UN 3216, UN 3218, UN 3219)

Division 6.1
(except UN 1549, UN 1550, UN 1551, UN 1556, UN 1557, UN 1593, UN 1599, UN 1655, UN 1686, UN 1690, UN 1710, UN 1812, UN 1887, UN 1888, UN 1897, UN 1935, UN 2024, UN 2025, UN 2026, UN 2074, UN 2077, UN 2233, UN 2501, UN 2505, UN 2515, UN 2609, UN 2655, UN 2656, UN 2674, UN 2713, UN 2747, UN 2785, UN 2788, UN 2821, UN 2831, UN 2853, UN 2854, UN 2855, UN 2856, UN 2871, UN 2874, UN 3141, UN 3144, UN 3146, UN 3283, UN 3293)

Division 6.2

Class 7
Excepted packages of radioactive material and packages assigned category I-White only

Class 8
(except UN 1731, UN 1740, UN 1755, UN 1757, UN 1783, UN 1787, UN 1788, UN 1789, UN 1814, UN 1819, UN 1824, UN 1848, UN 1908, UN 2430, UN 2496, UN 2508, UN 2564, UN 2578, UN 2585, UN 2586, UN 2672, UN 2677, UN 2679, UN 2681, UN 2693, UN 2790, UN 2803, UN 2809, UN 2837, UN 2869, UN 3145, UN 3253, UN 3320)

Class 9
(except UN 1931, UN 1941, UN 1990, UN 2211, UN 2590, UN 3268, UN 3314, UN 3316, UN 3363, UN 8000)

2.2.3 Where a packing group is assigned the dangerous goods in paragraph 2.2.2 are restricted to those in packing group III only.

~~(a) those permitted for transport on passenger aircraft~~;

~~(b) where a packing group is assigned, those in packing group III only~~;

~~(c) those which do not have any subsidiary risk; and~~

~~(d) those proper shipping names that do not include the letters "n.o.s", except where the addition of the technical name is not required and Flammable liquid, n.o.s (UN1993)~~.

— — — — — — — —

AMENDMENTS TO THE TECHNICAL INSTRUCTIONS - TABLE 3-1

. . .

Editorial Note. — In order to improve efficiency, a computerized database of Table 3-1 has been constructed; language versions are being developed. Amendments are show in UN number order based on the original entry. In the first column "OLD" denotes the currently existing entry, while "MOD" denotes the proposed amendments. "DEL" indicates the deletion of the entry. Deletions in individual columns are indicated by the symbol "###".

DANGEROUS GOODS PANEL (DGP)

NINETEENTH MEETING

Montreal, 27 October to 7 November 2003

AGENDA ITEM 3

The attached constitutes the report on Agenda Item 3 and should be inserted at the appropriate place in the yellow report folder.

(27 pages)

Agenda Item 3 : Resolution, where possible, of the non-recurrent work items identified by the Commission or the panel

3.1 PRINCIPLES GOVERNING THE TRANSPORT OF DANGEROUS GOODS ON CARGO ONLY AIRCRAFT

The rapporteur of the cargo aircraft only working group reported that, due to the pressure of other work, it had not been possible to make much progress so far. He provided a list of topics to be discussed and requested that an effort should be made by the group to consider these topics and discuss them at a sub-group meeting during the working group of the whole meeting in 2004. The meeting noted the report.

3.2 REFORMATTING OF THE PACKING INSTRUCTIONS

3.2.1 New Packing Instructions (DGP/19-WP/40)

3.2.1.1 It was recalled that the revision of the packing instructions had been discussed at two working group meetings and the final version, which it was proposed would replace the existing packing instructions, was now presented to the meeting for its review. It was suggested that the changes proposed were of such a fundamental nature that to expect their implementation in the next edition of the Technical Instructions was impractical. Therefore it was proposed to include the new packing instructions in the 2005-2006 edition for information only, with the explanation that they would replace the existing packing instructions in the 2007-2008 edition. This would give industry time to make the necessary changes to systems, training etc; it would also present an opportunity for industry to highlight any problems they might have and also identify any errors that may have been overlooked in the rationalization exercise.

3.2.1.2 It was further mentioned that every effort had been made to maintain alignment with the packing instructions recommended by the *UN Sub-Committee of Experts on the Transport of Dangerous Goods* UNSCETDG, but this had not always been possible. Members were also assured that the new packing instructions did not imply any changes to the quantity limitations in the dangerous goods list.

3.2.1.3 Members acknowledged the great deal of work that had gone into the preparation of the new packing instructions. In view of their volume and the fact that there had been little time to study them before the meeting, it was agreed that detailed comments would not be made at this meeting. The meeting therefore agreed that they could not be introduced into the 2005-2006 edition of the Technical Instructions. It was further agreed that industry should be given as much advance warning of the new packing instructions as possible, so that the DGP could receive input, and so that preparation for using the new provisions, especially training, could be undertaken in a timely manner. The following schedule of events was therefore agreed:

1) the packing instructions would be posted on the DGP (closed) website and members and observers would provide detailed comments to the Secretary by the end of February 2004;

2) an amended version of the packing instructions, based on members and observer's comments, would be posted on the (open) ICAO website as soon as possible

thereafter for public information with a statement that they would come into use with the 2007-2008 edition of the Technical Instructions;

3) the DGP would consider any other, possibly significant, changes required and discuss these at the working group in 2004; and

4) the finalized new packing instructions would be formally agreed upon at DGP/20 and included in the 2007-2008 edition of the Technical Instructions.

A note would also be included in the 2005-2006 edition of the Technical Instructions indicating that new packing instructions would be forthcoming in the 2007-2008 edition and indicating where the drafts could be found. Consideration may also be given by panel members and observers in the interim to a possible mechanism for phasing in the new packing instructions over a period of time (instead of a complete changeover on 1 January 2007). It was also noted that IATA would post the draft packing instructions on its website. It was also noted that the dangerous goods list would also need to be amended to reflect the new packing instructions.

3.2.2 **Supplementary changes to the Technical Instructions**

3.2.2.1 Three supplementary changes to the Technical Instructions arising from the development of the new packing instructions were brought to the meeting's attention. These were:

a) a revision to the general provisions in Part 4, Chapter 2;

b) a list of liquids and solids that are not addressed in the revised 13th edition of the UN model regulations; and

c) proposed amendments to the packing instructions in the Supplement.

3.2.2.2 It was agreed that items a) and c) should be deferred until the packing instructions themselves had been finalized. Item b) involved four substances where there appeared to be inconsistencies in the UN recommendations concerning solid and liquid variants. The meeting agreed in the case of mercury iodide (UN 1638) that the dangerous goods list entry for the "solution" version should be deleted completely and that the word "solid" should be removed from the name of the other (solid) version. In the case of the other three substances (UN 1733, 1740 and 2823) it was agreed that a State's representative would request the UNSCETDG to review the entries.

3.2.3 **Compatibility Aspects (DGP/19-WP/48)**

3.2.3.1 A member reminded the meeting that the first version of the proposed modifications to the packing instructions was presented by the working group on Packing Instructions at DGP-WG02. At this meeting, several comments had been received and it was agreed there should be further discussion on the subject of compatibility. A proposal to develop additional text regarding compatibility was subsequently agreed. This proposal was now being presented to the DGP/19 meeting for its review.

3.2.3.2 It had originally been proposed to amend the text relating to compatibility in each of the relevant parts of the Technical Instructions, but further consideration had led to the conclusion that only Part 4, Chapter 1, paragraph 1.1.3 should be changed.

3.2.3.3 The meeting agreed this was potentially a valuable change to the Technical Instructions and agreed to it in principle. However, it was also agreed that it should be sent to the UNSCETDG for its review. It could then be incorporated into the Technical Instructions, after intermodal review, when the new packing instruction review was completed. It was agreed that a State's representative would present the proposal to the UNSCETDG.

3.3 DANGEROUS GOODS GUIDANCE MATERIAL FOR SECURITY PERSONNEL (DGP/19-WP/20)

3.3.1 As agreed at a working group meeting, a small ad-hoc working group had developed guidance on dangerous goods in cargo for inclusion in the *Security Manual for Safeguarding Civil Aviation Against Acts of Unlawful Interference* (Doc 8973). The material developed was presented to the meeting for its review.

3.3.2 A proposal was made to add to the guidance material an example of an operator's dangerous goods acceptance checklist. This was agreed by the meeting.

3.3.3 The meeting expressed appreciation for the work that had been done. It approved the text which is shown in Appendix A to this part of the report, with minor amendments, and requested the Secretary to pass it to the Aviation Security Section of ICAO.

3.4 PROBLEMS WITH THE ACCEPTANCE OF RADIOACTIVE MATERIAL FOR TRANSPORT BY AIR (DGP/19-WP/47)

3.4.1 The Observer from IAEA drew the meeting's attention to increasing problems that had arisen over the last few years with the transport of radioactive material by air. Some of these problems related to the stricter requirements for the transport of radioactive material involving high levels of activity while other problems were experienced with the acceptance of packages with low levels of activity and packages containing short lived medical isotopes. These problems had received considerable attention at the recent International Conference on the Safety of Transport of Radioactive Material, hosted by the IAEA and co-sponsored by other international organizations, including ICAO, and held in cooperation with IATA.

3.4.2 At the request of its General Conference, IAEA was arranging a Technical Meeting in Vienna, during January 2004, to develop an action plan based on the findings of the International Conference on the Safety of Transport of Radioactive Material. All member States and relevant international organizations would be invited.

3.4.3 Particular concern had been expressed in IAEA over recent moves by a working group of DGP to propose a ban on the transport of small packages of radioactive material in the aircraft cabin. Such a ban would result in small aircraft (that do not have a cargo hold) being precluded from delivering short lived medical isotopes to remote areas in some States, which could be life threatening for patients in such areas.

3.4.4 It was noted that the amendment to the Technical Instruction in question was to 7;2.1.1 (see DGP/19-WP/8) which had been introduced mainly with the intention of preventing passengers from carrying excepted packages of radioactive dangerous goods on board an aircraft. In light of the points made by IAEA, the majority of members had no difficulty with not pursuing the proposed amendment. It was however cautioned that the provisions of the Technical Instructions should not be relaxed too much in this area, and it was also noted that States could take care of any problems caused nationally by using the exception procedure.

3.4.5 In light of the discussion it was agreed not to proceed with the proposed amendment to 7;2.1.1 but to develop a new amendment making it clear that excepted radioactive material must not be carried by passengers on their persons or in their baggage. An amendment to 8; 1.1.1 was consequently developed. It was pointed out that it was somewhat anomalous to include a reference in Part 8 to substances which could not be transported by passengers, when the whole Part was dedicated to substances that could be carried by passengers. However, it was noted that there was no clear statement concerning these substances in other parts of the Technical Instructions and the meeting decided to include the reference in 8;1.1.1. The meeting consequently developed the following recommendation:

Recommendation 3/1 — Amendment to the Technical Instructions

That the Technical Instruction be amended as indicated in Appendix B to the report on this Agenda Item.

3.4.6 Resulting from this discussion, the meeting agreed that it was most important that ICAO be represented at the meeting which IAEA is arranging in January 2004, (see 3.4.2 above) so that the panel can be fully informed of the problems which are being experienced. It was also pointed out that no ICAO representative had been able to attend a recent meeting of the UNSCETDG, so that there had been no formal presentation of the air mode's views. The meeting agreed that it was most important that the DGP Secretary should attend such meetings and it consequently developed the following recommendation:

Recommendation 3/2 — ICAO Presence at other UN Meetings concerning Dangerous Goods

That ICAO make every effort to ensure that the Secretary of the DGP is able to attend the regular meetings of the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods and meetings of the International Atomic Energy Agency concerning the transport of radioactive materials.

3.5 INFORMATION FROM THE IAEA CONCERNING A PROPOSED CHANGE TO THE REGULATORY REQUIREMENTS FOR AIR SHIPMENTS OF COBALT-60 (DGP/19-IP/8)

3.5.1 The meeting was reminded that the 1996 edition of the IAEA Regulations for the Safe Transport of Radioactive Material (Transport Regulations) had introduced a variety of stricter requirements for air shipment of radioactive material. These stricter requirements became effective for international air transport through the ICAO Technical Instructions on 1 July 2001. These stricter requirements significantly affected some types of air shipments, in particular those of typical quantities of Co-60 sealed sources.

3.5.2 At the beginning of 2002, the IAEA had started a review of its 1996 edition of the Transport Regulations by inviting proposals for changes. Four proposals were received concerning changes that would result in allowing the air shipment of the Co-60 sealed sources to resume. A working group at the September 2002 review panel meeting had reviewed these proposals and prepared a resulting proposed change for comments by member States. There was significant reluctance in plenary at the review panel meeting to accept this proposed change. It was eventually sent to States for further comments and comments have now been received. The proposed change and all the comments received were made available to the DGP/19 Meeting. Any comments from the DGP/19 Meeting were invited and would be presented to the next review panel meeting that will be held 10 - 14 November 2003 in Bonn.

3.5.3 Members expressed interest in the information but generally had not had time to study it. It was agreed that individual members would discuss the subject with their radioactive materials experts and provide comments, where possible, for transmission directly to IAEA through their IAEA representative.

3.6 INSPECTIONS (DGP/19-WP/36)

A member reminded the meeting that, at a working group meeting, it had been agreed that suitable text should be developed for the guidance of States in respect of conducting dangerous goods inspections. A proposed text for inclusion in the Supplement to the Technical Instructions was presented to the meeting for its review and was agreed, subject to deleting the reference to munitions of war and to refer to "dangerous goods reference publications" in Appendix A. The meeting consequently developed the following recommendation:

Recommendation 3/3 — Amendment to the Supplement to the Technical Instructions

That the Supplement to the Technical Instructions be amended as indicated in Appendix C to the report on this Agenda Item.

3.7 NEXT MEETING OF THE WORKING GROUP OF THE WHOLE PANEL

3.7.1 The Secretary advised the meeting that, because of ICAO's budgetary problems, her ability to travel to meetings might be restricted. ICAO was therefore requesting all panels to consider holding working group meetings in Montreal. The meeting noted this request. It agreed that attendance of the Secretary at working group meetings was essential.

3.7.2 The panel was invited to hold its next working group meeting of the whole in Dubai, United Arab Emirates, from 4 to 8 October 2004, and was pleased to accept this offer. It was also agreed that the new sub-group working on proposals for the revision of Part 8 would meet in Dubai immediately before the working group of the whole. The rapporteur of the sub-group would provide further details to members in due course.

— — — — — — — —

APPENDIX A

Security Manual for Safeguarding Civil Aviation Against Acts of Unlawful Interference
(Doc 8973 — Restricted)

Start of new text:

DANGEROUS GOODS IN AIR CARGO

1. Certain articles and substances are classified as "dangerous goods" by the ICAO *Technical Instructions for the Safe Transport of Dangerous Goods by Air*. The transport by air of dangerous goods in air cargo has been undertaken for many years. They are regularly and routinely carried all over the world and the requirements of the Technical Instructions are intended to ensure that this carriage does not put an aircraft and its occupants at risk during a flight. Although the primary task of personnel carrying out the duties of airport security screeners will be the detection of prohibited items, they also have a role to play in the safety of aviation by detecting dangerous goods in cargo which may be being shipped when not in compliance with the Technical Instructions.

2. The Technical Instructions list over 3 000 dangerous goods, which are all assigned to one of nine hazard classes, some of which are sub-divided into Divisions, due to the wide range of the Class. The Classes/Divisions denote the type of hazard - i.e.:

Class 1 ***Explosives***

Division 1.1	substances and articles which have a mass explosion hazard
Division 1.2	substances and articles which have a projection hazard but not a mass explosion hazard
Division 1.3	substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard
Division 1.4	substances and articles which present no significant hazard
Division 1.5	very insensitive substances which have a mass explosion hazard
Division 1.6	extremely insensitive articles which do not have a mass explosion hazard

Class 2 ***Gases***

Division 2.1	flammable gases
Division 2.2	non-flammable, non-toxic gases
Division 2.3	toxic gases

Class 3 ***Flammable Liquids***

Class 4 ***Flammable Solids and Reactive Substances***

Division 4.1	flammable solids

Division 4.2 substances liable to spontaneous combustion
Division 4.3 substances which, in contact with water, emit flammable gases

Class 5 ***Oxidisers and Organic Peroxides***

Division 5.1 oxidising substances
Division 5.2 organic peroxides

Class 6 ***Toxic and Infectious Substances***

Division 6.1 toxic (poisonous) substances
Division 6.2 infectious substances

Class 7 ***Radioactive Materials***

Class 8 ***Corrosive Substances***

Class 9 ***Miscellaneous Substances and Articles***

3. Some of the classes of dangerous goods may appear to have security implications e.g., explosives (ammunition, rocket motors, etc.), toxic material (cyanide, arsenic, etc.) and radioactive material (plutonium etc). However, provided the requirements of the Technical Instructions, and any other applicable requirements are met (e.g., Article 35 of the Chicago Convention requires States to place controls on the carriage by air of munitions of war which may or may not meet the criteria of dangerous goods), such items may legitimately be carried on an aircraft as air cargo.

4. The Classes are not in any order of precedence - i.e.,: explosives of Class 1 are not necessarily more dangerous than corrosives of class 8; each Class / Division has an inherent risk which needs to be recognised. Provision is made within some classes and divisions (i.e. Classes 3, 4, 8, 9 and Divisions 5.1 and 6.1) for the identification of the degree of danger and this is by assignment to a Packing Group based on specified criteria i.e.:

Packing Group I great danger
Packing Group II medium danger
Packing Group III minor danger

5. Many dangerous goods have more than one hazard - e.g.: benzyl bromide is both corrosive and toxic. When classifying dangerous goods, there is a system of deciding which is the primary hazard and which the subsidiary risk(s). This system has been devised for use when transporting dangerous goods; in the event of leakage, spillage, package damage, etc., any subsidiary risk should not be regarded as being less important since it may have the same potential as the primary hazard for causing injury or damage.

6. Depending on the level of hazard and the type of aircraft which is to be used for carriage, the Technical Instructions limits the quantity of dangerous goods per package; with very few exceptions, there

are no limitations per aircraft. Furthermore, the Technical Instructions broadly provides for the carriage of dangerous goods in four categories i.e., they may be:

a) permitted for carriage on both passenger and cargo aircraft;

b) permitted for carriage on cargo aircraft only;

c) forbidden on both passenger and cargo aircraft in normal circumstances but may be carried with the approval or exemption of the states concerned; and

d) forbidden for carriage by air under any circumstances.

7. With few exceptions dangerous goods must be packaged for air transport. The Technical Instructions contain general packing requirements and specific packing methods, which show the packagings permitted. They also give the specifications for those packagings and their testing.

IDENTIFICATION OF DANGEROUS GOODS

8. There are two primary tools that can be used to help identify the presence of dangerous goods:

Marking — Although the Technical Instructions requires various markings to be applied to packages of dangerous goods, it is the proper shipping name (the specific or generic name of the chemical or item) and corresponding UN number (a four digit number prefixed by "UN") are the means of identifying what is contained in a package; and

Labelling — There are two types of labels which a package of dangerous goods may bear:

Hazard warning labels, according to the dangerous goods contained within;

Handling labels. There are four of these; orientation arrows, magnetized material, cargo aircraft only and cryogenic liquid.

Attachment I shows an example of a correctly marked and labelled package. Examples of hazard warning and handling labels are shown at Appendix 24 Attachment B.

DECLARATION OF DANGEROUS GOODS

9. Most dangerous goods must be declared to the operator in the form of a Dangerous Goods Transport Document, which is commonly referred to by industry as the "Shipper's Declaration". This document is completed by the shipper and provides details of the dangerous goods e.g. proper shipping name, UN number; it also contains a certification by the shipper that all applicable requirements have been complied with. It is usually attached to the corresponding air waybill. Failure of a consignment to be accompanied by a shipper's

declaration will result in the consignment being regarded as "undeclared" dangerous goods, which the operator is required to report to the State in which the goods were discovered.

10. The format usually used for the Dangerous Goods Transport Document / Shipper's Declaration is that set down in the IATA Dangerous Goods Regulations (See attachment II).

11. The format usually used for the accepted Dangerous Goods Transport Document/Dangerous Goods Checklist is that set down in the IATA Dangerous Goods Regulations (see Attachment III).

ACCEPTANCE FOR AIR TRANSPORT

12. Once a shipper has completed the preparation for air transport the dangerous goods are forwarded to either the operator or a handling agent. The Technical Instructions require that an acceptance check be carried out on packages of dangerous goods and their documents, which is sufficiently comprehensive to ensure that the packages are not damaged and are in a fit state for carriage, and that both the packages and the documents appear to comply with all applicable requirements; the checks on the package are based on the external appearance and it is not opened.

TRAINING

13. The Technical Instructions requires agencies engaged in the security screening of cargo to receive dangerous goods training commensurate with their responsibilities. As a minimum, the subjects with which security personnel should be familiar are as follows:

General philosophy — a background to the subject, including what dangerous goods are;

Limitations — alleviations exist for dangerous goods needed for the operation of the aircraft; and for those to provide medical aid in flight;

Labelling and marking — the labels and markings on packages that identify the contents;

Provisions for passengers and crew — what passengers and crew can and cannot have in their baggage;

Emergency procedures — reporting of dangerous goods incidents and accidents, actions in emergencies.

INCIDENT REPORTING

14 The Technical Instructions requires the operator to report the following:

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 damage.

Note — *"Serious injury" is defined by ICAO as an injury which is sustained by a person in an accident and which*:

a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or

b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or

c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or

d) involves injury to any internal organ; or

e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or

f) involves verified exposure to infectious substances or injurious radiation.

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 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 constitute a dangerous goods incident.

Undeclared or misdeclared dangerous goods — when dangerous goods are discovered in cargo which are not accompanied by a dangerous goods transport document.

The reporting of the above is the responsibility of the operator. Consequently, if such occurrences are discovered by security staff, they should be reported in the first instance to the operator, as well as the emergency services, if appropriate.

DANGEROUS GOODS IN AIR MAIL

15. It is very common for air transport to be used for the carriage of air mail, both domestically and internationally. There is an almost total prohibition on dangerous goods in air mail, the only dangerous goods permitted being infectious substances (which may be accompanied by carbon dioxide solid (dry ice) as a refrigerant) or very low activity radioactive material, such that no labelling will be required, further details of which can be obtained from the operator. However, there have been incidents caused by undeclared dangerous goods, primarily in parcels, which have been given to operators for carriage (eg: leakages from wet batteries, flammable liquids, etc.). Consequently, security staff should be alert to the possibility of undeclared dangerous goods in air mail.

OPENING PACKAGES CONTAINING DANGEROUS GOODS

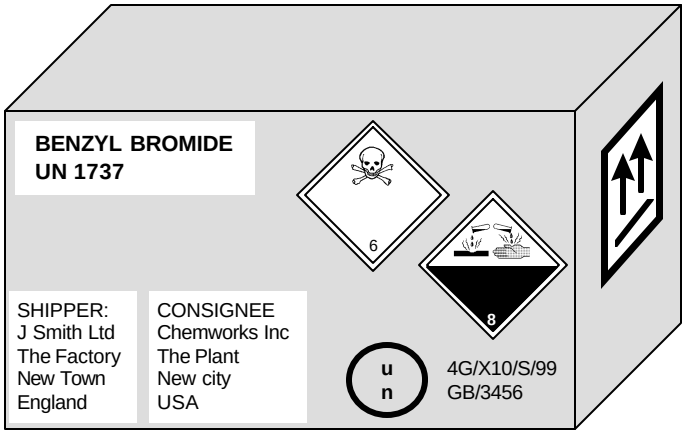
16. During the course of their duties, security staff may be consider opening packages consigned as cargo. However, packages of dangerous goods should only be opened in exceptional circumstances and then only with extreme caution, with the assistance of specialist qualified persons, if appropriate.

17 The majority of packages of dangerous goods will have been subjected to a stringent test regime in a particular configuration i.e., tests will have been undertaken with the inner packagings and furniture in a specific way. Consequently, should a package of dangerous goods be opened and no reason is found to prevent it's onward transport, it must be re-packed and sealed in exactly the same way in which it had been offered for transport. This may require the assistance of the shipper. Failure to do so may result in a dangerous goods incident at a later point in the journey

End of new text

— — — — — — — —

ATTACHMENT I



ATTACHMENT II

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Shipper

Air Waybill No.

Page of Pages

Shipper's Reference Number (optional)

Consignee

For optional use for Company logo name and address

Two completed and signed copies of this Declaration must be handed to the operator.

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: *(delete non-applicable)*

PASSENGER AND CARGO AIRCRAFT	CARGO AIRCRAFT ONLY

Airport of Departure:

Airport of Destination:

Shipment type: *(delete non-applicable)*

NON-RADIOACTIVE | RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification							
Proper Shipping Name	Class or Division	UN or ID No.	Packing Group	Subsidiary Risk	Quantity and type of packing	Packing Inst.	Authorization

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory

Place and Date

Signature (see warning above)

ATTACHMENT III

APPENDIX B

PART 8; CHAPTER 1

PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

1.1.1 Except as otherwise provided in 1.1.2 below, 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. 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.

PROPOSAL 1

Amend Part 8; 1.1.1 by adding the following *Note* immediately after the last sentence:
"*Note.- The restrictions relating to carriage by passengers and crew apply to infectious substances assigned to UN3373 Diagnostic Specimens/Clinical Specimens -see Packing Instruction 650, Section 9(iv).*"

PROPOSAL 2

Amend Part 8;1.1.1 by adding the following immediately after the words "dangerous goods" in the first sentence: ",including excepted packages of radioactive material,". The text would then read: "Except as otherwise provided in 1.1.2 below, dangerous goods, including excepted packages of radioactive material, must not be carried by……./".

— — — — — — — —

APPENDIX C

Start of new text:

INSPECTIONS

GUIDANCE TO STATES ON DANGEROUS GOODS INSPECTIONS

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 primarily in the inspection of operators and handling agents, although it is recognized that in some States it may be possible to conduct inspections on freight agents 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".

There are a number of aspects related to the carriage of dangerous goods by air which may be the subject of inspection:

ORGANIZATION AND PROCEDURES

The aim of the inspection is to assess the suitability of the organization and procedures established by the operator and of the facilities provided for the handling of dangerous goods, taking into account the nature and scale of the operation. If the operator uses a handling agent, the liaison between them needs to be checked to confirm that each knows what is expected of them by the other.

The inspection needs to confirm that the operator has sufficient resources for the intended operation and has identified those individuals who have specific responsibilities and has made them aware of their responsibilities. It will ensure that reference manuals are up-to-date and available to staff who will need to use them. The manner of loading and stowage on aircraft is checked to ensure it is carried out according to the requirements.

A form suitable for this type of inspection is at Attachment I.

CONSIGNMENT INSPECTION

The aim of checking consignments of dangerous goods is to determine that, as far as can be ascertained from an external check, the packages and their associated documents comply with the requirements; it also aims to determine, as far as possible, that associated documentation (e.g., air waybill, dangerous goods transport document, acceptance check list, written notification to commander) meets all applicable requirements. Inspections are carried out in the operator's or handling agent's premises and after the dangerous goods have been accepted for transport or whilst they are still in the care of the operator or handling agent.

Both export and import consignments are to be inspected but with the emphasis on export consignments since, if a consignment is found which does not comply with the requirements, action can be taken to prevent it from being loaded on an aircraft and investigation made into how it was offered for transport and accepted in the state in which it has been found. Import consignments are also to be checked, since although they have been carried by air, the finding of evidence of non-compliance with the requirements needs to be reported to the State where the goods were originally loaded on an aircraft.

OPERATIONS MANUAL AND OTHER STAFF INSTRUCTIONS

A check of the Operations Manual and other staff instructions should be made during the organization and procedures inspection referred to above. The Technical Instructions require the Operations Manual or other manuals to contain certain information when the operator intends to carry dangerous goods. In addition to this information, the Operations Manual needs to contain sufficient guidance material and instructions to enable all those concerned (both ground staff and flight and cabin crew) to meet their responsibilities. The Operations Manual inspection aims to confirm the information provided is adequate, complete and up-to-date; also that any handling agent has copies of the relevant parts of the manual or other instructions concerning the operators policy and procedures.

When an operator does not intend to carry dangerous goods, the Operations Manual should still be checked to ensure it contains information about the policy of the operator in regard to dangerous goods and instructions about the carriage of passengers with dangerous goods.

STAFF TRAINING

A training inspection is to confirm that all relevant staff of the operator or handling agent have been trained, that the training has been to the required standard and given within the required periods.

TRAINING PROGRAMMES

The Technical Instructions require that the operator's training programmes for all staff be approved. The inspection is to confirm that training meets the requirements of the Technical Instructions.

Depending on the size of the operator and the responsibilities of his staff, there may be several different training programmes, since the areas covered by the training and the depth to which they are covered will depend on the responsibilities of the persons concerned. Even if the operator does not carry dangerous goods there is still a need for training programmes for both operational and ground staff involved in dealing with passengers and their baggage. The dangerous goods training for such staff may be included with the training in, for example, safety and emergency procedures.

PASSENGER WARNING NOTICES

The Technical Instructions requires notices, warning passengers of the prohibition on dangerous goods in baggage, to be prominently displayed and in sufficient number so that passengers see them during their normal progression through departure procedures. The method of inspecting notices is to check those areas in

terminals where the operator (or his handling agent) issues tickets, checks in passengers and assembles them to board an aircraft. A form suitable for this purpose is at Attachment II.

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 operator to take action to remedy them. The request to the operator should include a time scale for taking remedial action.

FREQUENCY OF INSPECTIONS

The Technical Instructions does not specify the frequency of such inspections. However, the, *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* (Doc 8335), produced by ICAO, recommends that all significant aspects of the operator's procedures and practices should be inspected at least once in every twelve-month period. Consequently, states should consider inspecting all aspects related to dangerous goods of an operator engaged in the carriage of dangerous goods as cargo on an annual basis, as a minimum. Operators choosing not to carry dangerous goods as cargo may be inspected at a less frequent rate.

— — — — — — — —

ATTACHMENT I

DANGEROUS GOODS AUDIT FORM

Name of Operator: _____

Inspector: _____

Date(s) of Inspection: _____

Location: _____

Principle Operator/Handling Agent Personnel involved: _____

_____

The objective of the audit is to demonstrate that the operator has procedures in place, either on his own account and/or through his handling agent(s), to ensure the correct processing and handling of dangerous goods.

During the audit, if non-conformities are identified, they shall be entered against the applicable requirement in the "Non-Conformities" section in Appendix A. Where there is a non-conformity for a requirement that is not shown in Appendix A, it shall be added in the space provided. Observations, which are not non-conformities against a requirement or a procedure, shall be entered in the "Observations" Section.

At the end of the audit, the non-conformities and observations shall be discussed with the operator to ensure that they are understood, together with the need for action to be taken within the applicable timescales. The Inspector and a responsible person of the operator should then sign the Appendix in the spaces provided. The original shall be left with the responsible person, with a copy retained by the Inspector.

Level 1: Means any non-compliance with the Technical Instructions, which would lower the standard and probably hazard an aircraft or personnel. Depending on the extent of the Level 1 finding, consideration should be given to prohibiting the operator from carrying dangerous goods until corrective action has been taken.

Level 2: Means any non-compliance with the Technical Instructions, which could lower the standard and possibly hazard an aircraft or personnel. The corrective action period granted by the National Aviation Authority should be appropriate to the nature of the finding but in any case initially not more than three months.

Level 3: Means an observation intended to give background information. Level 3 must not include information suggesting non-compliance with the requirements of the Technical Instructions. No regulatory action is required to be taken in the case of level 3.

Ref	Summary of Requirement	Technical Instructions Reference	Audited	Non-Conformity	Level	Details Of Non-Conformity (Continued below where necessary)
1	Dangerous goods permissions, approvals or exemptions (held and correct)	N/A	“	“		Verify approval held if appropriate to State
2	Provision of information to handling agents	7;4.2	“	“		Verify manuals, staff instructions, etc. are provided
3	Information about dangerous goods contained in the Operations Manual/ other manuals	7;4.2	“	“		Verify information is present, correct and current
4	Provision of relevant manuals and instructions to cargo and operations staff	7;4.2	“	“		Verify manuals, staff instructions, etc. are provided
5	Up-to-date copies of dangerous goods reference publications (e.g. ICAO/IATA)	1;1.2	“	“		Verify copy held and which edition
6	Procedures for loading and stowing medical aid for a patient, and provision of information to handling agents	7;4.2	“	“		Verify procedure available
7	Compliance with requirements for “combi” aircraft where main deck hold is not at least Class B (exemption/approval or prohibition) and provision of information to handling agents	7;2.1	“	“		Verify compliance, if applicable
8	Procedures for notification by pilot-in-command to air traffic services in the event of an in-flight emergency	7;4.3	“	“		Verify availability
9	Emergency response guidance information on board aircraft	7;4.8	“	“		Verify availability

Ref	Summary of Requirement	Technical Instructions Reference	Audited	Non-Conformity	Level	Details Of Non-Conformity (Continued below where necessary)
10	Procedures for reporting of dangerous goods accidents, incidents and undeclared/ misdeclared dangerous goods, and liaison between handling agent/operator	7;4.4 & 7;4.5	"	"		Verify arrangement between operator and handling agent established to ensure reporting to appropriate authorities
11	Procedures for immediate notification to the competent authority of dangerous goods on board an aircraft in event of aircraft accident or incident	7;4.6	"	"		Verify arrangement between operator and handling agent established to ensure reporting to the State in which the accident occurred
12	Adequacy and standard of flight crew training	1;4.1.2	"	"		To be verified
13	Adequacy and standard of cabin crew training (including emergency response training)	1;4.1.2	"	"		To be verified
14	Adequacy and standard of ground staff training (including emergency response training)	1;4.1.2	"	"		To be verified
15	Dangerous goods training records maintained	1;4.2.4	"	"		To be verified
16	Currency of ground staff training	1;4.2.2	"	"		To be verified
17	Currency of flight/cabin crew training	1;4.2.2	"	"		To be verified
18	Training of security staff employed by the operator (for both cargo and passengers)	1;4.1.1g)	"	"		To be verified if applicable
19	Awareness of requirements by maintenance staff in respect of replacements or unserviceable items	1;2.2.2 & 1.2.2.3	"	"		To be verified

Ref	Summary of Requirement	Technical Instructions Reference	Audited	Non-Conformity	Level	Details Of Non-Conformity (Continued below where necessary)
20	Provision of information/ instructions on dangerous goods and passengers to passenger handling staff	7;4.2 & 7;6.1	“	“		Verify appropriate manuals, information, etc. available to passenger handling staff
21	Measures to ensure dangerous goods information is provided with /in passenger tickets	7;5.1.2a)	“	“		Confirm information provided e.g. at ticket sales point at airport
22	Procedures for dealing with and the reporting of passengers with dangerous goods that are not permitted (including liaison with security staff)	7;4.5	“	“		Verify arrangement between operator and handling agent established to ensure reporting to the State in which the dangerous goods were discovered
23	Dangerous goods notices at the cargo acceptance point	7;4.7	“	“		Check notice(s) in place
24	Dangerous goods notices at ticket sales desks, check-in desks and boarding areas (including measures to ensure they are displayed by handling agents)	7;5.1.2b)	“	“		Check notice(s) in place
25	Adequacy and use of acceptance checklists	7;1.1 & 7;1.3	“	“		Verify use and adequacy of checklist
26	Retention of acceptance check forms, dangerous goods transport documents (shipper's declarations) and NOTOCs	7:4.10	“	“		Verify documents are retained for at least 3 months
27	Handling of dangerous goods packages (including Divisions 4.1 & 5.2) in the warehouse	7;2.3 & 7;2.13	“	“		Verify packages are handled correctly
28	Preparation and building of pallets and ULDs with regard to segregation and separation of dangerous goods	7;2.2, 7;2.8, 7;2.9 & 7;2.11	“	“		Verify dangerous goods segregated in accordance with Technical Instructions
29	ULD marking and labelling	7;2.7	“	“		Verify ULD tags marked correctly (e.g., with class/division)

Ref	Summary of Requirement	Technical Instructions Reference	Audited	Non-Conformity	Level	Details Of Non-Conformity (Continued below where necessary)
30	Inspections for damage or leakage immediately prior to loading and immediately after unloading	7;3.1	"	"		Verify inspections carried out
31	Procedures for removal of damaged or leaking packages from aircraft, inspection of aircraft for contamination; and decontamination	7;3.1 & 7;3.2	"	"		Verify staff awareness of applicable procedures
32	Procedures for loading and stowing a wheelchair for a passenger (including notification to the commander)	8;1.1.2 j)	"	"		Verify procedure (check-in staff)
33	Correct loading of dangerous goods (including segregation, securing and accessibility)	7;2	"	"		Verify (by observation if possible), correct loading of dangerous goods
34	Completion of NOTOCs and provision to flight crew (including signing of form)	7;4.1	"	"		Verify correct completion (including signature/some other indication)
35	Accessibility of NOTOCs (or information on it) on ground at points of departure and scheduled arrival for duration of flight	7;4.1.6 &	"	"		Verify accessibility
36	Accessibility of dangerous goods transport document / shipper's declarations during journey	7;1.1.2	"	"		Verify accessibility

CAA Ref	Details Of Non-Conformity (Continued from above table)

Additional Observations

The following additional observations are made.

	Description
1	
2	
3	
4	
5	

Signature of Inspector _____ Date _____

Signature of Responsible Person* _____ Date _____

* Signature by the Responsible Person indicates that the non-conformities have been explained, not necessarily that the Responsible Person or the Operator concerned agrees with the non-conformities.

ATTACHMENT II

**DANGEROUS GOODS INSPECTION REPORT —
PASSENGER TERMINAL NOTICES**

AIRPORT:	**TERMINAL:**
DATE AND TIME OF INSPECTION:	**INSPECTOR:**

	Desk nos (if app)/ Gate nos (if app)/ Ticket sales desk	**Handling Agent or Operator (when self-operated)**	*** Operator(s) (only when identified by flight or as check-in)**	*** In use at time (T or X)**	**Notes/ Comments on prominence and sufficiency**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					

(* show operator only if "**T**" applicable and the handling agent is checking in passengers for that operator; otherwise leave operator blank)

	Desk nos (if app)/ Gate nos (if app)/ Ticket sales desk	Handling Agent or Operator (when self-operated)	* Operator(s) (only when identified by flight or as check-in)	* In use at time (T or X)	Notes/ Comments on prominence and sufficiency
14					
15					
16					
17					
18					
19					
20					

All notices sufficient and prominent, no further action.	**Signed:**	**Date:**

Not all notices sufficient and prominent, further action required:		
Action Required		
	Signed:	**Date:**

End of new text

— END —

(* show operator only if "**T**" applicable and the handling agent is checking in passengers for that operator; otherwise leave operator blank)