International Civil Aviation Organization

DGP/21-WP/48
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WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-FIRST MEETING

Montréal, 5 to 16 November 2007

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2009-2010 Edition

SECRETARIAT STUDY GROUP ON THE CARRIAGE AND SCREENING OF LIQUIDS, GELS AND AEROSOLS

(Presented by G.A. Leach)

SUMMARY

This working paper was originally presented to WG07 as DGP-WG/07-WP/41. It provides details of the Secretariat Study Group on the Carriage and Screening of Liquids, Gels and Aerosols and makes proposals to align with the revised security provisions.

Action by the DGP is in paragraph 2.

1. INTRODUCTION

1.1 On 26 and 27 February 2007, the first meeting was held of the ICAO Secretariat Study Group on the Carriage and Screening of Liquids, Gels and Aerosols. The Study Group was formed to "develop, before the end of June 2007, long-term, cost-effective and harmonious security measures which will not impact on the overall objective of safe and efficient civil aviation operations" and followed the proposed introduction of passenger security measures which, amongst other things, would limit receptacles of liquids in hand baggage to a capacity of 100 mL. The Secretary General had decreed that the group would consist of members of the Aviation Security (AVSEC) Panel, the Facilitation Panel and the Dangerous Goods Panel, and Geoff Leach was invited to attend in the capacity of deputising chairman of the DGP.

1.2 Prior to the meeting, working papers were sought, detailing any instances of disharmony between the new security provisions and any other existing ICAO requirements. Consequently, the three working papers appended to this working paper were submitted. Although these papers were presented, they were subject to minimal discussion, but were forwarded to AVSEC Panel members for comment.

1.3 Realistically, it is extremely unlikely that passengers will ever again be allowed to carry the kinds of quantities of liquids which are currently provided for by the Technical Instructions and it is suggested that the panel consider the "DGP options" in the working paper entitled "Liquid and gaseous dangerous goods currently permitted by the Technical Instructions in hand baggage" as proposals to change the Technical Instructions.

2. ACTION BY THE DGP

2.1 The DGP is invited to consider the following proposals:

2.1.1 It is proposed to replace the existing Part 8;1.1.2 a) with the following text:

a) when in retail packagings, alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume, ~~in receptacles not exceeding 5 L,~~ with a total net quantity per person of 5 L for such beverages~~;~~, subject to the following conditions:

carriage may be:

1) in checked baggage, in receptacles not exceeding 5 L;

2) in carry-on baggage if purchased after an airport security screening point in receptacles not exceeding 5 L;

3) in carry-on baggage if placed there prior to an airport security screening point, in receptacles not exceeding 100 mL.

Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to ~~any restrictions~~ the requirements above, except that for security reasons, a) 3) will apply.

2.1.2 It is proposed to replace the existing Part 8;1.1.2 b) with the following text:

b) non-radioactive medicinal or toilet articles (including aerosols)~~. Also~~ and aerosols in Division 2.2, with no subsidiary risk, for sporting or home use~~ is permitted in checked baggage only. The~~ with a total net quantity~~ of all such articles carried by each~~per person~~ must not exceed~~ of 2 kg or 2 L, subject to the following conditions:

1) for non-radioactive medicinal or toilet articles (including aerosols), carriage may be:

i) ~~and the net quantity of each single article must~~ in checked baggage, in receptacles not exceeding 0.5 kg or 0.5 L~~.~~;

ii) in carry-on baggage if purchased after an airport security screening point, in receptacles not exceeding 0.5 kg or 0.5 L;

iii) in carry-on baggage, if placed there prior to an airport security screening point, in receptacles not exceeding 0.5 kg or 100 mL;

2) for aerosols in Division 2.2 with no subsidiary risk for sporting or home use, carriage must be in checked baggage;

3) Release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents.

Note.— ~~The term~~ "~~m~~Medicinal or toilet articles (including aerosols)" is intended to include such items as hair sprays, perfumes, colognes and medicines containing alcohols.

2.1.3 It is proposed amend Part 8;1.1.2 c) as follows:

c) with the approval of the operator(s), as checked baggage only, small gaseous oxygen or air cylinders required for medical use;

2.1.4 It is proposed to amend Part 8;1.1.2 k) as follows:

k) hair curlers containing hydrocarbon gas, as checked baggage only, no more than one per person, provided that the safety cover is securely fitted over the heating element. Gas refills for such curlers must not be carried;

2.1.5 It is proposed to amend Part 8;1.1.2 m) as follows:

m) with the approval of the operator(s), as checked baggage only, no more than two small cylinders of carbon dioxide or another suitable gas in Division 2.2, per person, fitted into a self-inflating life-jacket for inflation purposes, plus no more than two spare cartridges;

2.1.6 It is proposed to amend 8;1.1.2 p) as follows:

p) with the approval of the operator(s), as checked baggage only, one avalanche rescue backpack per person equipped with a pyrotechnic trigger mechanism containing not more than 200 mg net of Division 1.4S and a cylinder of compressed gas of Division 2.2 not exceeding 250 mL. The backpack must be packed in such a manner that it cannot be accidentally activated. The airbags within the backpack must be fitted with pressure relief valves;

2.1.7 The AVSEC Panel have been asked whether "articles", such as fuel cells, should be regarded differently in respect of the quantities of liquid they can contain. Should the AVSEC Panel wish to apply the revised security provisions to articles, it is proposed to replace the existing 8;1.1.2 r) 4) with the following text:

r) portable electronic devices (for example cameras, cellular phones, laptop computers and camcorders) powered by fuel cell systems, and spare fuel cartridges, under the following conditions:

. . .

4) ~~the maximum quantity of fuel in any fuel cell cartridge must not exceed~~fuel cell cartridges are subject to the following limitation on the fuel they contain:

a) if purchased after an airport security screening point:

~~a)~~ for liquids 200 mL; or

~~b)~~ for liquefied gases, 120 mL for non-metallic fuel cell cartridges or 200 ml for metal fuel cell cartridges;

b) if purchased placed in hand baggage prior to an airport security screening point, in receptacles not exceeding 100 mL.

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APPENDIX

ICAO SECRETARIAT STUDY GROUP ON THE CARRIAGE AND SCREENING OF LIQUIDS, GELS AND AEROSOLS

First Meeting

(Montreal, 26 and 27 February 2007)

DISHARMONY IN THE APPLICATION OF SECURITY RULES AS THEY APPLY TO SAFETY MATCHES AND LIGHTERS

(Presented by G A Leach)

Background

In his e-mail of 7 February 2007, Mr Marriott requested details of examples of disharmony in the application of the new security provisions. Whilst not a disharmony with the new provisions *per se*, there does appear to be differing interpretations of the provisions as they apply to the carriage by passengers of safety matches and lighters. The issues appear to fall under 2 headings:

Whether passengers are still permitted to carry matches or lighters – At many airports, collection points have been located prior to security screening for passengers to dispose of any sharp items or liquids they may have inadvertently carried with them. However, it has become the practice for many passengers to dispose of lighters and matches at such collection points often, it would appear, because of security staff not being aware of the conditions under which a passenger may carry such items. The Technical Instructions permits the carriage by a passenger of a small packet of safety matches or a lighter (other than those containing unabsorbed liquefied fuel). Carriage must be on the person i.e. in a pocket, because such items present a far greater risk if carried in baggage. The Dangerous Goods Panel feels very strongly that in the interests of flight safety, this provision should remain, due to the increased likelihood of passengers secreting such items in baggage with the attendant increased risk of fire that a ban would lead to; in the United Kingdom in the last 25 years, there have been in excess of 50 fires in baggage caused by matches and lighters. If there was to be an ignition in the pocket of a passenger, it would be immediately apparent to those nearby (not least the passenger) and would occur in close proximity to trained staff (cabin crew) with access to fire extinguishers. The same would not be so if an ignition were to occur in baggage. Quite apart from any in-flight issue, disposing of lighters and matches in such fashion raises storage and disposal issues for the airport. It has also been reported that there has been at least one fire in airport terminal caused by lighters removed at the airport security screening point.

The new provisions appear to encourage passengers to pack lighters in their cabin baggage – the new security provisions require permitted quantities of liquids (i.e. less that 100mL) to be placed in a bag which must fit into cabin baggage. However, as explained above, lighters are not permitted in cabin baggage, only on the person, and so if a passenger places a plastic bag

containing a cigarette lighter containing liquefied gas in their cabin baggage, this would conflict with the requirement of the Technical Instructions.

Proposal

It is proposed that the security provisions of ICAO make it clear that matches and lighters must not, under any circumstances, be packed in baggage, but that one small packet of safety matches or a cigarette lighter may be carried on the person.

- END -

ICAO SECRETARIAT STUDY GROUP ON THE CARRIAGE AND SCREENING OF LIQUIDS, GELS AND AEROSOLS

First Meeting

(Montreal, 26 and 27 February 2007)

CARRIAGE OF FUEL CELLS IN CABIN BAGGAGE

(Presented by G A Leach)

Background

The 2007-2008 edition of the Technical Instructions contains new provisions for carriage by passengers of small fuel cells, which are similar to batteries as they rely on chemical reactions to release energy in the form of electricity. However, they differ from batteries in that they use small quantities of free liquid or gas to derive their power. It has been suggested that in the not too distant future, fuel cells will be used extensively to power mobile phones, laptops, MP3 players etc much as lithium ion batteries are used now. The Technical Instructions permit the carriage by passengers of fuel cells containing not more than 200mL of flammable liquids (typically methanol), formic acid (a low/medium danger corrosive liquid) or butane (a flammable gas). Because the technology is new and unproven, the Dangerous Goods Panel erred on the side of caution and required carriage as hand baggage, using the same philosophy as that used in requiring cigarette lighters to be carried on the person i.e. any fire would be immediately apparent to those nearby and would occur in close proximity to trained staff (cabin crew) with access to fire extinguishers. However, the new security provisions allow only 100mL of a liquid; this would necessitate a revision to the Dangerous Goods Panel's decision.

A fuel cell containing a liquid is very different to, say, a perfume or drinks bottle in that it is an article constructed of plastic or metal, much like a battery, and would have to be broken apart to release the liquid. It is suggested that articles such as these should be considered differently to other containers of liquids.

Proposal

The Study Group is invited to consider whether “articles” should be viewed differently to other types of receptacles for liquids in determining the maximum quantity of liqiuid permitted.

- END -

ICAO SECRETARIAT STUDY GROUP ON THE CARRIAGE AND SCREENING OF LIQUIDS, GELS AND AEROSOLS

First Meeting

(Montreal, 26 and 27 February 2007)

LIQUID AND GASEOUS DANGEROUS GOODS CURRENTLY PERMITTED BY THE TECHNICAL INSTRUCTIONS IN HAND BAGGAGE

(Presented by G A Leach)

Background

At appendix I is an extract from the 2007-2008 edition of the Technical Instructions for the Safe Transport of Dangerous Goods by Air detailing the items of "dangerous goods" which are permitted for carriage in passenger baggage. The items which have been highlighted relate to liquid or gaseous dangerous goods which are permitted either in hand baggage or on the person and which will presumably be of interest to the Study Group. All other items are either solids or items permitted only as checked baggage.

At their Working Group meeting in October 2006, the Dangerous Goods Panel agreed to introduce the following text at the beginning of paragraph 1.1.2:

> "Notwithstanding any additional restrictions which may be implemented by States in the interests of aviation security, except for the incident reporting provisions of 8;4.4, the provisions of these Instructions…"

It was the intention of the Working Group that this would be promulgated in an Addendum to the Technical Instructions, but would be very much an interim measure until the Dangerous Goods and AVSEC Panels agreed a common approach. The highlighted items of the appended extract do not align, to varying degrees, with the current security provisions and it is suggested the Study Group look at these on a case by case basis to determine what actions could be taken to resolve the differences. To assist the Study Group, the following is offered to promote debate:

Item	DGP options	AVSEC options
Alcoholic beverages	Revise current requirement as per text at appendix II	Revise security provisions to permit carriage in accordance with current Technical Instructions provision
Medicinal or toiletry articles, including aerosols	Revise current requirement as per text at appendix III	
Small cylinders for medical use	Require carriage as checked baggage	
Small cylinders for operation of mechanical limbs, including spares	Unrealistic to forbid carriage, although possibly need to consider clarification of number of spares permitted	If not already provided for, revise the current security provisons to allow such cylinders
Cigarette lighters	The subject of a separate working paper	
Hair curlers	Require carriage as checked baggage	Revise security provisions to permit carriage in accordance with current Technical Instructions provision
Life jackets and spare cylinders	Require carriage as checked baggage	
Avalanche rescues back packs	Require carriage as checked baggage	
Fuel cells	The subject of a separate working paper	

- END –

Appendix I

Part 8, Chapter 1

PROVISIONS FOR DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

Parts of this Chapter are affected by State Variations CH 1, US 5; see Table A-1

1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

1.1.1 Except as otherwise provided in 1.1.2, dangerous goods, including excepted packages of radioactive material, must not be carried by passengers or crew members, either as or in carry-on baggage or checked baggage or on their person. 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.

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):

a) when in retail packagings, alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume, in receptacles not exceeding 5 L, with a total net quantity per person of 5 L for such beverages;

Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to any restrictions.

b) non-radioactive medicinal or toilet articles (including aerosols). Also aerosols in Division 2.2, with no subsidiary risk, for sporting or home use is permitted in checked baggage only. The total net quantity of all such articles carried by each person must not exceed 2 kg or 2 L and the net quantity of each single article must not exceed 0.5 kg or 0.5 L. Release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents. The term “medicinal or toilet articles (including aerosols)” is intended to include such items as hair sprays, perfumes, colognes and medicines containing alcohols;

c) with the approval of the operator(s), small gaseous oxygen or air cylinders required for medical use;

d) small 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 packaged cartridges (UN 0012 or UN 0014 only), 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;

≠ f) dry ice in quantities not exceeding 2.5 kg per person, when used to pack perishables that are not subject to these Instructions, provided the package permits the release of carbon dioxide gas. The dry ice may be either:

— in carry-on baggage; or

— with the approval of the operator(s), in checked baggage.

When carried in checked baggage, each package must be marked:

— “DRY ICE” or “CARBON DIOXIDE, SOLID”; and

— with the net weight of dry ice or an indication that the net weight is 2.5 kg or less;

≠ g) one small packet of safety matches or a cigarette lighter that does not contain unabsorbed liquid fuel (other than liquefied gas), intended for use by an individual when carried on the person. Matches and lighters are not permitted in checked or carry-on baggage. Lighter fuel and lighter refills are not permitted on one’s person, in carry-on or checked baggage;

Note.— “Strike anywhere” matches are forbidden for air transport.

h) radioisotopic cardiac pacemakers or other devices, including those powered by lithium batteries, implanted into a person, or radio-pharmaceuticals contained within the body of a person as the result of medical treatment;

i) with the approval of the operator(s), wheelchairs or other battery-powered mobility aids with non-spillable batteries (see Packing Instruction 806 and Special Provision A67), as checked baggage provided the battery terminals are protected from short circuits and the battery is securely attached to the wheelchair or mobility aid;

j) with the approval of the operator(s), wheelchairs or other battery-powered mobility aids with spillable batteries as checked baggage, provided that the wheelchair or mobility aid can be loaded, stowed, secured and unloaded always in an upright position and that the battery is disconnected, the battery terminals are protected from short circuits and the battery is securely attached to the wheelchair or mobility aid. If the wheelchair or mobility aid cannot be loaded, stowed, secured and unloaded always in an upright position, the battery must be removed and the wheelchair or mobility aid may then be carried as checked baggage without restriction. The removed battery must be carried in strong, rigid packagings as follows:

   1) these packagings must be leaktight, impervious to battery fluid and be protected against upset by securing them to pallets or by securing them in cargo compartments using appropriate means of securement (other than by bracing with freight or baggage) such as by use of restraining straps, brackets or holders;

   2) batteries must be protected against short circuits, secured upright in these packagings and surrounded by compatible absorbent material sufficient to absorb their total liquid contents; and

   3) these packagings must be marked “Battery, wet, with wheelchair” or “Battery, wet, with mobility aid” and be labelled with a “Corrosive” label (Figure 5-21) and with a package orientation label (Figure 5-25).

   The pilot-in-command must be informed of the location of a wheelchair or mobility aid with an installed battery or the location of a packed battery.

   It is recommended that passengers make advance arrangements with each operator; also unless batteries are non-spillable they should be fitted, where feasible, with spill-resistant vent caps;

k) hair curlers containing hydrocarbon gas, no more than one per person, provided that the safety cover is securely fitted over the heating element. Gas refills for such curlers must not be carried;

l) with the approval of the operator(s), as carry-on baggage only, a mercurial barometer or mercurial thermometer carried by a representative of a government weather bureau or similar official agency. The barometer or thermometer must be packed in a strong outer packaging, having a sealed inner liner or a bag of strong leakproof and puncture-resistant material impervious to mercury, which will prevent the escape of mercury from the package irrespective of its position. The pilot- in-command must be informed of the barometer or thermometer;

m) with the approval of the operator(s), no more than two small cylinders of carbon dioxide or another suitable gas in Division 2.2, per person, fitted into a self-inflating life-jacket for inflation purposes, plus no more than two spare cartridges;

n) with the approval of the operator(s), heat producing articles (i.e. battery-operated equipment such as underwater torches and soldering equipment which, if accidentally activated, will generate extreme heat and can cause fire) may be carried in carry-on baggage only. The heat producing component, or the energy source, must be removed so as to prevent unintentional functioning during transport;

o) one small medical or clinical thermometer which contains mercury, for personal use, when in its protective case;

≠ p) with the approval of the operator(s), one avalanche rescue backpack per person equipped with a pyrotechnic trigger mechanism containing not more than 200 mg net of Division 1.4S and a cylinder of compressed gas of Division 2.2 not exceeding 250 mL. The backpack must be packed in such a manner that it cannot be accidentally activated. The airbags within the backpack must be fitted with pressure relief valves;

q) consumer electronic devices (watches, calculating machines, cameras, cellular phones, laptop computers, camcorders, etc.) containing lithium or lithium ion cells or batteries when carried by passengers or crew for personal use. Spare batteries must be individually protected so as to prevent short circuits and carried in carry-on baggage only. In addition, each spare battery must not exceed the following quantities:

   — for lithium metal or lithium alloy batteries, a lithium content of not more than 2 grams; or

— for lithium ion batteries, an aggregate equivalent lithium content of not more than 8 grams.

Lithium ion batteries with an aggregate equivalent lithium content of more than 8 grams but not more than 25 grams may be carried in carry-on baggage if they are individually protected so as to prevent short circuits and are limited to two spare batteries per person.

r) portable electronic devices (for example cameras, cellular phones, laptop computers and camcorders) powered by fuel cell systems, and spare fuel cartridges, under the following conditions:

1) fuel cell cartridges may only contain flammable liquids (including methanol), formic acid and butane;

2) fuel cell cartridges must comply with International Electrotechnical Commission (IEC) PAS 62282-6-1 Ed. 1;

3) fuel cell cartridges must not be refillable by the user. Refuelling of fuel cell systems is not permitted except that the installation of a spare cartridge is allowed. Fuel cell cartridges which are used to refill fuel cell systems but which are not designed or intended to remain installed (fuel cell refills) are not permitted to be carried;

4) the maximum quantity of fuel in any fuel cell cartridge must not exceed:

a) for liquids 200 mL;

b) for liquefied gases, 120 mL for non-metallic fuel cell cartridges or 200 ml for metal fuel cell cartridges;

5) each fuel cell cartridge must be marked with a manufacturer's certification that it conforms to IEC PAS 62282-6-1 Ed. 1, and with the maximum quantity and type of fuel in the cartridge;

6) each fuel cell system must conform to IEC PAS 62282-6-1 Ed. 1, and must be marked with a manufacturer's certification that it conforms to the specification;

7) no more than two spare fuel cell cartridges may be carried by a passenger;

8) fuel cell systems containing fuel and fuel cell cartridges including spare cartridges are permitted in carry-on baggage only;

9) interaction between fuel cells and integrated batteries in a device must conform to IEC PAS 62282-6-1 Ed. 1. Fuel cell systems whose sole function is to charge a battery in the device are not permitted;

10) fuel cell systems must be of a type that will not charge batteries when the portable electronic device is not in use and must be durably marked by the manufacturer: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to so indicate; and

11) in addition to the languages which may be required by the State of Origin for the markings specified above, English should be used.

Appendix II

a) when in retail packagings, alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume, with a total net quantity per person of 5 L for such beverages, subject to the following conditions:

(i) carriage may be

1. in checked baggage, in receptacles not exceeding 5 L;

2. in hand baggage [if purchased after an airport security screening point], in receptacles not exceeding 5 L;

3. in hand baggage [if placed there prior to an airport security screening point], in receptacles not exceeding 100mL

Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to any restrictions.

Appendix III

b) non-radioactive medicinal or toilet articles (including aerosols), and aerosols in Division 2.2 with no subsidiary risk for sporting or home use, with a total net quantity per person of 2 kg or 2 L, subject to the following conditions:

(i) for non-radioactive medicinal or toilet articles (including aerosols), carriage may be:

1. in checked baggage, in receptacles not exceeding 0.5 kg or 0.5 L;

2. in hand baggage [if purchased after an airport security screening point], in receptacles not exceeding 0.5 kg or 0.5 L;

3. in hand baggage, [if placed there prior to an airport security screening point], in receptacles not exceeding 0.5 kg or 100mL

(ii) for aerosols in Division 2.2 with no subsidiary risk for sporting or home use, carriage must be in checked baggage.

(iii) Release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents.

Note.— "medicinal or toilet articles (including aerosols)" is intended to include such items as hair sprays, perfumes, colognes and medicines containing alcohols