



WORKING PAPER

DANGEROUS GOODS PANEL (DGP)

TWENTY-SEVENTH MEETING

Montréal, 16 to 20 September 2019

Agenda Item 2: Managing air-specific safety risks and identifying anomalies

2.2: Develop proposals, if necessary, for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)* for incorporation in the 2021-2022 Edition

SELF-INFLATING PERSONAL SAFETY DEVICES CARRIED BY PASSENGERS OR CREW

(Presented by Sam Bitossi)

SUMMARY

This working paper proposes an amendment to Table 8-1 of the Technical Instructions to increase the current limit of one self-inflating personal safety device per person permitted, allowing the carriage of two self-inflating personal safety devices per person through the operator approval process. This paper proposes to allow the carriage of two spare cartridges to be permitted per device.

Additional wording has also been included to clarify that self-inflating personal safety devices are devices intended to be worn by the person.

Action by the DGP: The DGP is invited to consider the proposed changes in Appendix A to this working paper and if agreed, amend Table 8-1 of the Technical Instructions:

- to increase the limitation of one personal safety device per person to two;
- to increase the limitation of two spare cartridges per device (i.e. a total of no more than four cartridges per person);
- to consider additional wording to clarify that a personal safety device is one intended to be worn by a person.

1. INTRODUCTION

1.1 This is a revised proposal following on from the original proposal submitted to the eighteenth working group meeting of the Dangerous Goods Panel (DGP-WG/18, Montréal, 1 to 5 October 2018) (see paragraph 3.2.2.5 of the DGP-WG/18 Report).

1.2 It is common within Australia for passengers to request the carriage of more than one self-inflating personal safety device, leading to an increase in passengers seeking approval to travel with multiple devices for their own personal use.

1.3 In addition to life-jackets, there are now other self-inflating personal safety devices on the market, such as self-inflating motorcycle jackets, horse riding vests, seniors' hip airbags and bicycle vests.

1.4 This working paper proposes to increase the number of self-inflating personal safety devices (permitted under Table 8-1 with operator approval) from the current allowance of one personal safety device per person, to set a new limit of two personal safety devices per person.

1.5 The existing restriction of two cartridges fitted into each device will remain unchanged.

1.6 For the two devices, proposed wording will be added to allow for up to two spare cartridges per device, with an intended total of no more than four spare cartridges per person.

1.7 The words “no more than two spare cartridges per device” is intentional to clarify that in instances when only one device is being carried, that the carriage of four spare cartridges is not permitted.

1.8 The proposed changes will allow passengers to take two self-inflating personal safety devices within the provisions, reducing the likelihood of the passenger hiding extra devices within checked baggage.

1.9 During the discussion at DGP-WG/18, some panel members expressed the view that further wording is required to clarify that the provision is only intended for self-inflating personal safety devices that are designed to be worn by the person and does not include other safety devices, such as single person life rafts. Subsequently, the wording “intended to be worn by a person” has been added to the descriptor in Table 8-1 for dangerous goods item 12).

1.10 Research has been conducted regarding the capacities of cartridges commonly found within self-inflating personal safety devices. Appendix B to this working paper collates information regarding the various types of self-inflating personal safety devices, their respective CO₂ cartridge information and the methods of activation required for inflation.

1.11 In the report of DGP-WG/18 regarding the discussion of working paper DGP-WG/18-WP/18 (see paragraph 3.2.2.5 of the DGP-WG/18 Report), the panel queried the absence of a limit on the cartridge size of the existing provision. This paper does not recommend that the DGP set a limit on the cartridge size for the following reasons:

- a) the current technology for self-inflating personal safety devices does not demand the use of larger cartridges at this time, with the cartridge sizes detailed in Appendix B remaining minimal in fluid capacity (100 ml or less)*;

- b) the size of the cartridge required for the device to function to their design varies; and, taking into consideration the current fluid capacity data within Appendix B, there isn't a safety need identified at this stage to support setting a capacity limit;
- c) approval of the operator is required, which allows the device (including any cartridges) to be risk assessed by the operator at that point in time.

**Note.— The information in Appendix B also demonstrates that the fluid capacity of cartridges is not necessarily directly related to the cartridges' size or weight.*

1.12 Self-inflating personal safety devices are designed with multiple actions required for inflation to be achieved. These features act as a failsafe when carried as baggage and the likelihood of a device unintentionally self-inflating or activating during flight would be very unlikely.

1.13 There have been no known record of safety concerns or reports of unintentional activation of self-inflating personal safety devices inflight, when carried by passengers or crew under the provisions of Table 8-1.

1.14 However, if activation did occur, the consequence would be insignificant, with any release of energy likely contained within a passenger's bag, having little to no effect on the aircraft and its occupants.

1.15 The entry in Table 8-1 for self-inflating personal safety devices should continue to exclude devices that contain explosives (such as avalanche backpacks) to ensure a thorough review of such items is conducted on a case-by-case basis.

2. ACTION BY THE DGP

2.1 The DGP is invited to consider increasing the current limit of one self-inflating personal safety device to allow for a maximum of two self-inflating personal safety devices and if agreed, amend Table 8-1 of the Technical Instructions as shown in Appendix A.

2.2 The DGP is invited to consider the additional wording to clarify that no more than two spare cartridges per device may be carried and if agreed, amend Table 8-1 of the Technical Instructions as shown in Appendix A.

2.3 The DGP is invited to consider the proposed wording to clarify that the self-inflating personal safety device is one that is intended to be worn by the person and if agreed, amend Table 8-1 of the Technical Instructions as shown in Appendix A.

APPENDIX A

PROPOSED AMENDMENT TO PART 8 OF THE TECHNICAL INSTRUCTIONS

Part 8

PROVISIONS CONCERNING
PASSENGERS AND CREW

Chapter 1

PROVISIONS FOR DANGEROUS GOODS
CARRIED BY PASSENGERS OR CREW

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1.1 DANGEROUS GOODS CARRIED BY PASSENGERS OR CREW

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Table 8-1. Provisions for dangerous goods carried by passengers or crew

<i>Dangerous Goods</i>	<i>Location</i>		<i>Approval of the operator(s) is required</i>	<i>Restrictions</i>
	<i>Checked baggage</i>	<i>Carry-on baggage</i>		
Gases in cylinders and cartridges				
...				
12) Cartridges of Division 2.2 with no subsidiary hazard fitted into a self-inflating personal safety device, <u>intended to be worn by a person</u> , such as a life-jacket or vest	Yes	Yes	Yes	a) no more than one <u>two</u> personal safety devices <u>per person</u> ; b) the personal safety device(s) must be packed in such a manner that it <u>they</u> cannot be accidentally activated; c) must be for inflation purposes; d) no more than two cartridges are fitted into the <u>each</u> device; and e) no more than two spare cartridges <u>per device</u> .
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APPENDIX B

SELF-INFLATING PERSONAL SAFETY DEVICE AND GAS CARTRIDGE INFORMATION

The following are examples of self-inflating personal safety devices with their respective CO₂ cartridge information and the methods of activation for each device required for inflation:

Self-inflating personal safety devices	Method(s) of Activation	Weight of cartridge (g)	Number of cartridges fitted into device	Fluid capacity (ml)
Life-jacket (Infant 89N)	<ul style="list-style-type: none"> — Water activated or — Activation via manually pulling toggle 	9 g*	2	12 ml
Life-jacket (Child 80N)		17 g*	1	23 ml
Life-jacket (Adult 150N)		16 g*	2	21 ml
Life-jacket (Adult 156N) – General Aviation		16 g*	2	21 ml
Life-jacket (Adult/Child 169N)		16 g*	2	21 ml
Life-jacket (Adult 100-110N)		24 g*	1	33 ml
Life-jacket (Adult 150N)		33 g*	1	45 ml
Life-jacket (Adult 200N)		38 g*	1	53 ml
Life-jacket (Adult 275-280N)		60 g*	1	82 ml
Equestrian vest (Child S/M)	<ul style="list-style-type: none"> — Lanyard connecting rider to saddle via stirrup strap, activation via pulling lanyard in process of rider separating from horse (lanyard requires min. 30kg pull to activate) 	155 g	1	50 ml
Equestrian vest (Child L, Adult S/M/L/XL)		185 g	1	60 ml
Equestrian vest (Adult LL/XLL)		305 g	1	100 ml
Motorcycle vest (Child S/M)	<ul style="list-style-type: none"> — Lanyard connecting rider to bike, activation via pulling lanyard in process of rider separating from bike (lanyard requires min. 30kg pull to activate) 	155 g	1	50 ml
Motorcycle vest (Child L, Adult S/M/L/XL)		185 g	1	60 ml
Motorcycle vest (Adult LL/XLL)		305 g	1	100 ml
Bicycle vest	<ul style="list-style-type: none"> — Sensor attached to underside of saddle (small lithium-thionyl chloride battery 2.7Wh) remains dormant until activation during an accident, 	185 g	1	60 ml

Self-inflating personal safety devices	Method(s) of Activation	Weight of cartridge (g)	Number of cartridges fitted into device	Fluid capacity (ml)
	main board in vest turns on when zipped up (lithium ion battery 8.51Wh) and activates inflation only when sensors on saddle detect motion and separation from the sensors in rider's vest			
Seniors Hip Airbag (T1/XS)	— Hip air bag switched on by fastening the clip, activation uses algorithm (contains lithium ion battery 8.51Wh) which analyses motion and fall in context together	155 g	1	50 ml
Seniors Hip Airbag (T2-T5/S-XL)		185 g	1	60 ml

** Fill coefficient between 0.73g-0.78g per ml. An average of 0.75g per ml applied.*

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