



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)  
MEETING OF THE WORKING GROUP OF THE WHOLE**

**Memphis, 30 April to 4 May 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**

**Agenda Item 2.8: Part 8 — Provisions Concerning Passengers and Crew**

**CLARIFICATIONS CONCERNING CARRIAGE OF FUEL CELLS BY  
PASSENGERS AND CREW**

(Presented by the USFCC)

**SUMMARY**

This working paper raises some issues relating to Part 8, Chapter 1, paragraph 1.1.2 of the Technical Instructions and proposes solutions to them.

Action by the DGP-WG is in paragraph 2.

**1. INTRODUCTION**

1.1 DGP-WG/07 is invited to review some issues relating to Part 8, Chapter 1, paragraph 1.1.2 of the Technical Instructions and consider some of the solutions proposed. To facilitate the discussion, an extract of the fuel cells provisions concerning passengers and crew appears in the appendix to this paper.

**2. ACTION BY THE DGP-WG**

2.1 The DGP-WG is invited to consider the following issues relating to 8;1.1.2 and to consider the solutions proposed:

- a) 8;1.1.2 r) was approved to allow fuel cell powered devices on board as passenger carry-on. The following requirements in paragraph 1.1.2 r) apply to the fuel cells and to their fuel cell cartridges. The suggested rewording below focuses on the fuel cell and the fuel cell cartridges and clarifies the situation.

Solution: It is proposed to reword the paragraph as follows:

- r) fuel cell systems used to power 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:

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- b) The current wording of 8;1.1.2 r 5) and 6) is inconsistent and repetitious.

Solution: It is proposed to reword the two sentences and combine them in one sentence as follows:

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

- ~~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;~~

- c) Existing paragraph 8;1.1.2 r) 2) which states:

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

is redundant as covered by the above paragraph accordingly, it is proposed to delete it and renumber remaining paragraphs.

*Note.— The WG is invited to note that the third amendment proposed below (paragraph d) becomes irrelevant if the proposal to adopt the UN text proposed in another paper is agreed.*

- d) Packing Instruction 313 which applies to fuel cells cartridges, UN 3473, states:

“If fuel cell cartridges are shipped as an integral component of assembled equipment, they must be securely installed and protected against contact with other articles so as to prevent short circuit.”

A short circuit can only happen if electricity is stored or generated.

Solution: It is therefore proposed to amend the wording as follow:

If fuel cell cartridges are shipped as an integral component of assembled equipment, they must be securely installed and protected against contact with other articles so as to prevent inadvertent operation and short circuit.

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## APPENDIX A

### EXTRACT FROM PART 8, CHAPTER 1, PARAGRAPH 1.1.2 OF THE TECHNICAL INSTRUCTIONS

#### 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

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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):

- 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.

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