International Civil Aviation Organization
WORKING PAPER

DGP-WG/05-WP/22
14/3/05

DANGEROUS GOODS PANEL (DGP)

MEETING OF THE WORKING GROUP OF THE WHOLE

Montreal, 18 to 22 April 2005

Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions* for incorporation in the 2007/2008 edition
2.8: Part 8 - Provisions Concerning Passengers and Crew

FORMIC ACID FUEL CELL SYSTEMS

(Presented by Judith Code)

1. INTRODUCTION

1.1 New micro fuel cell technologies are proving to be a viable and valuable alternative power source for consumer electronics. Many believe micro fuel cell technologies will ultimately replace rechargeable batteries, such as lithium ion, in hand held electronics.

1.2 The Formic Acid Fuel Cell (FAFC) system is a micro fuel cell technology designed to provide consumers with a long lasting energy source for their portable electronic devices. It provides continuous and uninterrupted power by converting formic acid fuel to energy. One of the unique features of the FAFC is that that an empty fuel cartridge can be 'hot swapped' with a full one while the electronic device is still operational. As long as the FAFC system has a source of fuel, there will always be a source of energy for powering portable electronics; no electrical outlet is required.

1.3 It is anticipated that by 2006 the FAFC will be able to meet the energy demands of advanced electronic devices.

1.4 The FAFC will have 100 ml or less of formic acid and can be shipped as cargo under the following conditions:

- Proper Shipping Name, UN number and Packing Group
  a. Formic acid, UN1779, Packing Group II
- Passenger Aircraft
  a. Excepted quantity less than or equal to 30 milliliters in the inner packages that total to 0.5 liters in the outer package.
  b. Limited quantity limit is 0.1 liters in the inner packages that total to 0.5 liters in the outer package. The inner and outer packages specifications are in the packaging instruction Y808.

c. The fully regulated limit is 1 liter in the inner package that totals to 1 liter in the outer package also. The packaging instruction is 808.

- Cargo Aircraft
  a. 2.5 liter inner packages that total to 30 liters in the outer packages. The packaging instruction is 812.

1.5 The fuel cell power unit (FAFC system without the cartridge but with possible residual amounts of formic acid inside the fuel cell power unit) can be shipped under the provisions of UN3363 which covers “Dangerous Goods in Machinery”.

1.6 The Risk Assessment conducted on the FAFC system (fuel cell power unit plus fuel cartridge; See Information Paper) sufficiently demonstrates these systems will be designed and tested so they will be suitable for safe transport in passenger carry-on baggage.

2. PROPOSAL

2.1 During Working Group 04 the United States indicated its intent to propose that a passenger and crew member exception for fuel cell cartridges and equipment containing fuel cell cartridges be introduced in the 2007-2008 TI’s. The exception would allow passengers and crew members to carry a specific number of spare cartridges and equipment containing cartridges (such as laptop computers, cell phones and personal electronic planners) on their person and in checked baggage.

2.2 This Working Group is requested to consider the information provided in this working paper and corresponding DGP-WG/05-IP/2 and to provide comments to Canada on whether the formic acid fuel cell should be considered for inclusion in the fuel cell cartridges and equipment containing fuel cell cartridges exemption.

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