



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

Abu Dhabi, United Arab Emirates, 7 to 11 November 2010

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 2013/2014 Edition

**FUEL CELL INDUSTRY UPDATE — FUEL CELLS ISSUES DISCUSSED AT
THE 37TH SESSION OF THE SUB-COMMITTEE OF EXPERTS
ON THE TRANSPORT OF DANGEROUS GOODS**

(Presented by IEC)

SUMMARY

This paper provides an update on the discussion on fuel cells at the 37th UNSCOE, Geneva, 21 to 30 June 2010.

No action is necessary from the DGP-WG.

1. INTRODUCTION

1.1 The 37th UN Subcommittee of Experts on the Transport of Dangerous goods (UNSCOE) considered a paper submitted by the International Electro technical Commission. The paper addressed the five entries for fuel cell cartridges (UN 3473, 3476, 3477, 3478 and 3479), which appear in the United Nations Model Regulations, covering fuel cell cartridges, fuel cell cartridges contained in equipment and fuel cell cartridges packed with equipment. The IEC paper proposed to expand the current provisions for fuel cell cartridges to permit the transport of fuel cells or/and fuel cell cartridges, containing one of the permitted dangerous goods. To achieve this objective, the following amendments were proposed:

- a) expand the proper shipping name of UN 3473, 3476, 3477, 3478 and 3479, appearing in Chapter 3.2, “Dangerous Goods List”, Column 2, under “Name and description” to cover fuel cells in addition to cartridges;
- b) amend slightly Special Provisions 328 and 339, appearing in Chapter 3.3, paragraph 3.3.1 to reflect the above; and
- c) amend slightly Packing Instruction P004 to align with the change proposed above.

1.2 The US Fuel Cell Council (USFCC) advised the UNSCOE that it had reviewed the issue of fuel cells containing dangerous goods and concluded that fuel cell systems containing internal reservoirs containing fuel can be shipped as FUEL CELL CARTRIDGES CONTAINED IN EQUIPMENT providing that certain requirements were met:

- a) The internal reservoir must be effectively sealed and must meet the definition of a fuel cell cartridge from Special Provision 328:

“Fuel cell cartridge means an article that stores fuel for discharge into the fuel cell through a valve(s) that controls the discharge of fuel into the fuel cell.”

- b) The fuel must be sealed in the internal reservoir and must not leak out during transport.

- c) The internal reservoir must meet the requirements for a FUEL CELL CARTRIDGE CONTAINED IN EQUIPMENT, as follows:

- 1) as required by Special Provision 328, the internal reservoir must be constructed to prevent fuel leakage under normal conditions of transport;
- 2) internal reservoir design types must pass a 1.2 meter drop test in accordance with Special Provision 328;
- 3) internal reservoirs using hydrogen stored in metal hydrides as fuel must meet all requirements of Special Provision 339, including a 1.8 meter drop test;
- 4) internal reservoir design types using liquids as fuels must pass an internal pressure test at a pressure of 100 kPa (gauge) without leakage in accordance with Special Provision 328;
- 5) the entire system must be protected against inadvertent operation and activation as required by Packing Instruction P004; and
- 6) internal reservoirs containing liquefied flammable gases must meet the requirements of Special Provision 338.

1.3. Accordingly, the US Fuel Cell Council considered that the current Model Regulations are sufficient to ensure safe transport of fuel cell systems with internal reservoirs containing fuel (dangerous goods) and that no change to expand the proper shipping name of UN 3473, 3476, 3477, 3478 and 3479, appearing in Chapter 3.2, “Dangerous Goods List”, Column 2, under “Name and description” to cover fuel cells, in addition to cartridges, was necessary.

1.4. The UNSCOE agreed with the USFCC interpretation that the current Model Regulations are sufficient and that no changes to add new proper shipping names are necessary. The UNSCOE also agreed to a proposal made by France to clarify that when batteries were contained in the shipment, this hazard needed to be taken into account, in addition to the other hazards present in the shipment.