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**Committee of Experts on the Transport of Dangerous Goods  
and on the Globally Harmonized System of Classification  
and Labelling of Chemicals****Sub-Committee of Experts on the Transport of Dangerous Goods****Forty-first session**

Geneva, 25 June – 4 July 2012

Item 3 (a) of the provisional agenda

**Listing, classification and packing: proposals of amendments to the  
list of dangerous goods of Chapter 3.2****Fuel cell cartridges/Excepted quantities****Transmitted by the Dangerous Goods Advisory Council (DGAC)<sup>1</sup>****Introduction**

1. The requirements for excepted quantities in paragraph 3.5.1.1 limit the applicability of the provisions to substances and specifically exclude articles. It is understood that at the time the excepted quantity provisions were adopted, it was recognized that the applicability to select articles could be taken up at a later date. It is noted that prior to the adoption of excepted quantity provisions in Chapter 3.5 of the Model Regulations, almost identical provisions existed in the International Civil Aviation organization (ICAO) Technical Instructions for the Safe Transport of and the United States of America Hazardous Materials Regulations (49 CFR). At that time, the provisions in both those regulations also permitted articles to be transported under provisions for excepted quantities of dangerous goods. There is no known safety basis for the decision to exclude articles from the provisions of Chapter 3.5.

2. Small fuel cell cartridges that are authorized for use by passengers on passenger aircraft (and, where a limited number of such cartridges may, as spares, also be carried in checked baggage (some with the publication of the 2013-2014 ICAO Technical Instructions)) would seem suitable for transport as excepted quantities of dangerous goods.

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<sup>1</sup> In accordance with the programme of work of the Sub-Committee for 2011-2012 approved by the Committee at its fifth session (refer to ST/SG/AC.10/C.3/76, para. 116 and ST/SG/AC.10/38, para. 16).

3. By special provision 328 these fuel cell cartridges must withstand a 1.2 meter drop test in an unpackaged condition. All known cartridges in the excepted quantity size range are intended for use by consumers, including when they travel on passenger aircraft. Under the ICAO Technical Instructions, through IEC standards incorporated by reference in Part 8, paragraph 1.1.2(t) of ICAO Technical Instructions (Part 8, Table 8-1 in the 2013-2014 edition), these devices are subject to severe abuse conditions to which they may be exposed while in the hands of consumers. These test requirements, which are in addition to the tests required by the applicable special provisions in the Model Regulations, include:

- A 1.8 meter drop of the device unpackaged;
- A 100 kg (981 N) crush test;
- A 95 kPa differential pressure test at 22 °C or an internal pressure test of twice the gauge pressure of the fuel cell cartridge at 55 °C, whichever is greater;
- Vibration testing (up to 8 gn at 200 Hz); and
- Extreme temperatures from - 40 °C to + 70 °C.

4. The severe test requirements suggest that these cartridges are able to withstand conditions more severe than those that are applicable to inner packagings currently authorized by the excepted quantity provisions.

5. These cartridges themselves closely resemble inner packagings. In some cases, the fuels, in inner packagings, are authorized for transport under the excepted quantity provisions.

6. DGAC proposes that small fuel cell cartridges be authorized for transport as excepted quantities through appropriate amendments as provided below.

## Proposal

7. DGAC proposes to permit fuel cell cartridges as excepted quantities of dangerous goods by:

- Replacing “E0” in column 7(b) of the Dangerous Goods List with “E2” for the entries UN 3473, 3476, 3477, 3478 and 3479;
- Adding a new special provision XXX against each of the above entries in column (6);
- Introducing a new special provision XXX in Chapter 3.3 to read:  
“XXX Fuel cell cartridges transported separately from equipment that meet the applicable special provisions of this Chapter and the requirements in Part 8, Table 8-1 of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air may be transported as excepted quantities of dangerous goods. For fuel cell cartridges, the limits in 3.5.1.2 for inner and outer packagings should be taken as the limiting quantity of fuel per fuel cell cartridge and per outer packaging, respectively.”.
- Revising 3.5.1.1 as follows:  
“3.5.1.1 Excepted quantities of dangerous goods of certain classes, ~~other than~~ including articles specifically provided for in the Dangerous Goods List, meeting the provisions of this Chapter are not subject to any other provisions of these Regulations except for:”.