

## 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

4 December 2012

### Forty-second session

Geneva, 3 – 11 December 2012

Item 2 (b) of the provisional agenda

**Recommendations made by the Sub-Committee on its thirty-ninth,  
fortieth and forty-first sessions and pending issues:  
listing, classification and packing**

## Neutron radiation detectors

### Transmitted by the Dangerous Goods Advisory Council

**Based on the Subcommittee's discussion on document -2012/60 the  
proposal is revised as follows:**

**Proposal 1:** Introduce in the glossary two new terms:

“**Neutron radiation detector** is a hermetically sealed electron tube transducer that converts neutron radiation into a measurable electric signal. The gas in the device is the neutron detection medium.

**Radiation detection system** is an apparatus that contains radiation detectors as components.”.

**Proposal 2:** Add a new special provision XXX against UN~~10083363~~ to read as follows:

“XXX Neutron radiation detectors containing non-pressurized boron trifluoride gas ~~in excess of 1 gram~~ may be transported under this entry provided that the following conditions are met.

- (a) Each radiation detector shall meet the following conditions.
  - (i) The pressure in each detector must not exceed 105 kPa absolute at 20°C;
  - (ii) The amount of gas must not exceed ~~42.813~~ g per detector;
  - (iii) Each detector must be manufactured under a registered quality assurance program;  
*Note: ISO 9001 is an acceptable program for this purpose.*
  - (iv) Each neutron radiation detector must be of welded metal construction with brazed metal to ceramic feed through assemblies. They must have a minimum burst pressure of 1800 kPa as demonstrated by design qualification testing; and
  - (v) Each detector must be tested to a  $1 \times 10^{-10}$  cc/sec leak tightness standard before filling.
- (b) Radiation detectors transported as individual components shall be transported as follows:

- (i) Detectors shall be packed in a sealed intermediate plastic liner with sufficient absorbent material to absorb the entire gas contents;
  - (ii) They shall be packed in strong outer packaging. The completed package shall be capable of withstanding a 1.8 meter drop test without leakage of gas contents from detectors;
  - (iii) The total amount of gas from all detectors per outer packaging shall not exceed ~~524.2~~ g.
- (c) Completed neutron radiation detection systems containing detectors meeting the conditions of paragraph (a) shall be transported as follows:
- (i) The detectors shall be housed in a strong sealed outer casing;
  - (ii) The housing shall contain sufficient absorbent material to absorb the entire gas contents;
  - (iii) The completed systems shall be packed in strong outer packagings capable of withstanding a 1.8 meter drop test without leakage unless a system's outer casing affords equivalent protection.

The transport document shall include the following statement "Transport in accordance with special provision xxx".

Except for air transport, radiation detection systems meeting the requirements of paragraph (c) are not subject to other requirements of these Regulations.

Neutron radiation detectors containing not more than 1 gram of boron trifluoride, including those with solder glass joints, are not subject to these Regulations provided they meet the requirements in paragraph (a) and are packed in accordance with paragraph (b). Radiation detection systems containing such detectors are not subject to these Regulations provided they are packed in accordance with paragraph (c).".

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