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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-third session
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Item 3 (c) of the provisional agenda
Listing, classification and packing: miscellaneous

Requirements for radiation detectors containing Division 2.2 gases under pressure

Transmitted by the Dangerous Goods Advisory Council (DGAC)[1]

1. During last biennium's discussion on radiation detectors under UN 1008, it was noted that other radiation detectors employ other gases that act as the radiation detection medium, and that these detectors should also be covered in the Model Regulations. These other detectors typically contain gases of Division 2.2 that are in a compressed state.

2. Related shipping names of gases employed in Div. 2.2 detectors include:

UN 1006 Argon, compressed

UN 1013 Carbon Dioxide

UN 1046 Helium, compressed

UN 1056 Krypton, compressed

UN 1066 Nitrogen, compressed

UN 1065 Neon, compressed

UN 2036 Xenon and

UN 1956 Compressed gas, n.o.s. that are mixtures of the above named gases, including up to 5% carbon dioxide.

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

3. Transport of individual detectors, or completed radiation detection systems or instruments is common. Since, for practical reasons, the detectors can not be made to a recognized pressure receptacle standard, detectors must be transported under special authorizations. by incorporating specific provisions in the regulations, the need for special authorization can be eliminated.

Description of typical Division 2.2 detectors

4. Under US DOT regulations radiation detectors that contain only Division 2.2 gases are subject to the following:

- The detector may have a maximum design operating pressure of up to approximately 50 bar (700 psig) and have a maximum capacity of 10.5 liters;

- The detector must have a minimum burst pressure of 4 times the design pressure for detectors not fitted with a relief device and 3 times the design pressure when a relief device is fitted; and

- Detectors must be transported in strong outer packagings capable of withstanding a 1.2 meter drop test without breakage of the detector or rupture of the outer packaging. Equipment that includes a detector must be packaged in a strong outer packaging or the equipment must afford equivalent protection.

These types of detectors have been transported worldwide without incident for 70 years. Radiation detection systems are needed for purposes of both safety and security as well as nuclear medical, nuclear energy, industrial gauging, and aerospace applications. It is anticipated that the above requirements are common to many detectors in use today.

Proposal

5. DGAC recommends that a unique proper shipping name be established for radiation detectors containing Division 2.2 gases as follows:

Add the following new entry to the Dangerous Goods List:

(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
YYYY	RADIATION DETECTOR, containing a Division 2.2 compressed gas	2.2			ZZZ 274	120ml	E1	P003	PPX		

Add the following new special provision:

ZZZ Non-specification pressure receptacles are authorized provided:

- The maximum design pressure at ambient temperature shall not exceed 50 bar except that, **i**f the pressure receptacle is of a non-welded design, the maximum fill pressure shall not exceed 30 bar;

- The receptacle capacity shall not exceed 12 litres;

- Each pressure receptacle shall have a minimum burst pressure of at least 3 times the design operating pressure when a relief device is fitted and at least 4 times the design operating pressure when no relief device is fitted;

- Pressure receptacles shall be manufactured from material which will not fragment upon rupture; and

- Each detector shall be manufactured under a registered quality assurance programme.

Note: The application of ISO 9001:2008 may be considered acceptable for this purpose.

Add a new PPX in P003 as follows:

PPX For UN YYYY, detectors shall be transported in a strong outer packagings capable of withstanding a 1.2 meter drop test without breakage of the detector or rupture of the outer packaging. Equipment that includes a detector(s) shall be packaged in a strong outer packaging unless the detector(s) is afforded equivalent protection by the equipment in which it is contained.