



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

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Item 2 (c) of the provisional agenda

Explosives and related matters: electronic detonators

New UN entries for Electronic Detonators

**Transmitted by the Australian Explosives Industry and Safety Group
(AEISG)***

Introduction

1. The current edition of the Model Regulations contains the following entries for detonators, other than those used in ammunition:

<i>Name and description</i>	<i>Class</i>	<i>UN Number</i>
DETONATORS, NON-ELECTRIC for blasting	1.1B	0029
	1.4B	0267
	1.4S	0455
DETONATORS, ELECTRIC for blasting	1.1B	0030
	1.4B	0255
	1.4S	0456
DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting	1.1B	0360
	1.4B	0361
	1.4S	0500

* In accordance with the programme of work of the Sub-Committee for 2017–2018 approved by the Committee at its eighth session (see ST/SG/AC.10/C.3/100, paragraph 98 and ST/SG/AC.10/44, paragraph 14).

2. An additional range of detonators for blasting known as ‘electronic detonators’ has been introduced. Such detonators utilise an integrated circuit and/or micro processing technology to provide communications, energy control and storage capability, timing delay information and commands in order to send a firing signal to the initiating charge.
3. Electronic detonators should not be confused with electric detonators, having significantly different design characteristics, and improved safety and security benefits:
 - (a) Electronic detonators cannot be fired electrically without pre-programming and communication via associated relevant electronic blasting firing devices;
 - (b) Electronic detonator wire leads do not attach directly to a match head or bridge wire as in electric detonators;
 - (c) Electronic detonators are not susceptible to extraneous/stray/induced currents or static discharges;
 - (d) Communication between electronic detonators and firing device ensures continuity and minimizes the potential for misfires;
 - (e) Electronic firing systems enable operators to limit firing to authorised operators and prevents misuse.
4. In many jurisdictions, existing electric detonator regulations continue to be applied mistakenly to electronic detonator technologies, and the proper differentiation of these two detonator technologies in the Model Regulations will assist in the education and training of all relevant parties.
5. The range of detonators fired by signal/shock tube, and incorporating a pre-programmed microchip delay rather than a pyrotechnic one, are **NOT** “electronic detonators” but continue to be correctly labelled as:

	<i>1.1B</i>	<i>0360</i>
<i>“DETONATOR ASSEMBLIES”</i>	1.4B	0361
<i>NON-ELECTRIC for blasting</i>	1.4S	0500

They are simply signal/shock tube detonators with a more accurate, pre-programmed delay, and do not incorporate all the safety and security features of electronic detonators.

6. While the safety of transporting electronic detonators might not be significantly different from other detonator types, the precedent of entries in the Model Regulations for different detonator types has been set. Further, the existing available entries require electronic detonators to be labelled as “DETONATORS, ELECTRIC for blasting” which is both incorrect and confusing, creating potential for risks in down-stream storage, use and handling operations.
7. Electronic detonators cannot reasonably or legitimately be included within the existing entries and, as with other explosives, the proper classification of these devices will depend on packaging. Hence new entries would need to include all possible classifications.

Proposal

8. It is proposed that new UN entries be included in Chapter 3.2 of the Model Regulations for electronic detonators as follows:

<i>UN No</i>	<i>Name and description</i>	<i>Class</i>	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
(1)	(2)	(3)									
05XX	DETONATORS, ELECTRONIC for blasting	1.1B					0	EO	P131		
05XX	DETONATORS, ELECTRONIC for blasting	1.4B					0	EO	P131		
05XX	DETONATORS, ELECTRONIC for blasting	1.4S			347		0	EO	P131		

9. It is also proposed that consequential amendments be made to the Glossary of Terms in Appendix B of the Model Regulators as follows:

- (a) Amend the explanation of ‘Detonators’ to:

“Detonators

Articles consisting of a small metal or plastics tube containing explosives such as lead azide, PETN or combinations of explosives. They are designed to start a detonation train. They may be constructed to detonate instantaneously, or may contain a delay element. The term includes:

DETONATORS FOR AMMUNITION and
DETONATORS for blasting, ~~both~~ ELECTRIC, and NON-ELECTRIC and
ELECTRONIC.

Detonating relays without flexible detonating cord are included”;

and

- (b) Include a new explanation for “DETONATORS, ELECTRONIC for blasting” as follows:

“DETONATORS, ELECTRONIC for blasting

Detonators utilizing electronic components, such as an integrated circuit and/or micro processing technology to provide communications, an energy control and storage capability, timing delay information and validated commands in order to send a firing signal to the initiating charge.”.