

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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EXPLOSIVES AND RELATED MATTERS

Additional test for 1.4S classification

Transmitted by the Institute of Makers of Explosives (IME)

Introduction

1. IME is the safety association of the commercial explosives industry in the United States and Canada. The primary emphasis of IME is the safety and security of employees, users, the public, and the environment in the manufacture, transportation, storage, handling, use, and disposal of commercial explosive materials used in mining, construction and other infrastructure development and maintenance operations. IME encourages and supports the development of policies, procedures, guidelines, and regulations that further this cause.
2. At its thirty-third session the Sub-Committee provisionally adopted Test 6(d), an unconfined package test to be applied to certain candidates for classification into Division and Compatibility Group 1.4S¹. The purpose of this test is to evaluate whether hazardous effects occur outside of the package as a result of accidental ignition or initiation of the explosives inside the package.
3. At the same time, the Sub-Committee provisionally adopted a new Special Provision 347 that limits application of the 6(d) test to the following entries: UN Nos. 0323, 0366, 0441, 0445, 0455, 0456, 0460 and 0500². The table in [Annex 1](#) lists all 1.4S entries and distinguishes between those entries to which the proposed SP 347 would apply and those to which it would not.

¹ [ST/SG/AC.10/C.3/66](#), paragraph 9

² Ibid.

Comments

4. IME believes that the history of decades of 1.4S shipments without incident support its opinion that current testing already provides an appropriate level of safety that results in the appropriate classification of 1.4S explosives. However, the majority of the explosives working group have prevailed in their opinion that a new 6(d) test is necessary and have recommended such to the Sub-committee. In IME's opinion, the explosives working group has abandoned a risk-based approach to dangerous goods classification. The current classification scheme takes into account the probability of the accidental functioning of an explosive article. Many articles, especially those that are designed for 1.4S classification, are designed in such a way that it would be virtually impossible for them to accidentally function while in the transport mode. IME cannot envision conditions in transportation that would cause these 1.4S articles to function in the package. A risk-based approach considers the probability of an event happening and the consequences of that event. The explosives working group has provided no evidence that, or described a reasonable scenario in which, 1.4S articles can function on their own in transportation. The explosives working group has assumed that an event will occur and has considered only the consequence side of the risk assessment equation. IME contends that the same approach to classification of most other dangerous goods would eliminate or severely curtail their transportation.

5. Regarding the proposed SP 347, IME objects to the proposed limitation of the 6(d) test to only certain entries of Class 1.

- (a) This limitation is a departure from the UN performance-based classification system. We are unaware of any other classification test specifically targeted at individual or selected entries. Instead, the UN system is a performance based system, where objectives are established and those who would benefit from those objectives must prove eligibility through performance of tests. Applying the proposed 6(d) test to only a select few of all 1.4S entries is a specification system that may have to be continually adjusted as new information is developed or as system failures are observed.
- (b) 1.4S classification is highly dependent upon the packaging and that packaging can have a significant effect on whether hazardous effects may occur outside of the package. Targeting the proposed 6(d) test to specific entries does not take into account this influence of packaging upon 1.4S classification and could lead to unnecessary testing of items to which the test is required by proposed SP 347 or the failure to test items where packaging is insufficient to limit hazardous effects. For example, consider electric detonators (UN0456). This entry is one of those subject to proposed SP 347; however, the only two examples provided by the expert from Canada in [ST/ST/AC.10/C.3/2008/11](#) for electric detonators show that they pass the test. Examination of other test data and package construction might have led to the conclusion that the 6(d) test was not necessary for these detonators in the specific packaging described.
- (c) IME believes that a more reasonable approach to this issue would be to provide guidelines as to when the test need not be performed. If this were done, instances of unnecessary testing as described above could be avoided.

6. In Section 16.7.1.5 of the proposed 6(d) test, some examples of test results have been provided. However, as IME has previously observed³, this example set is very limited. Included are example data representing only one-half of the items covered by proposed SP 347 and only 15 percent of the diverse array of current 1.4S UN entries. During previous Sub-committee and explosives working group sessions, IME has recommended that additional examples be provided; however, no further examples have been added. The limited number of examples seems to indicate that development work for this test has been concentrated on a few target items, and that other 1.4S entries have not been checked to confirm that the test is actually appropriate for its stated purpose.

7. The Sub-Committee and the explosives working group have not considered how the new 6(d) test will be implemented with regards to existing approvals.

- (a) When will use of the test be required?
- (b) What is the effect on existing 1.4S explosives?
- (c) If existing 1.4S explosives must be evaluated under the 6(d) test, when must this be completed by?

Depending on the answers to these questions, there are many 1.4S explosives, which are appropriately classified, that may need to be subjected to costly testing needlessly. The Sub-Committee should consider a more practical approach were a limited number of articles could be tested to determine whether they are appropriately classified based on sharing of test results and data between the various Nationally recognized and approved test facilities. This effort could be used to fine tune the test methodology, acceptance criteria, and to identify problematic classifications and packaging configurations. Otherwise, the current approach could lead to a wide array of implementation schemes and confusion amongst competent authorities and carriers.

Conclusion

8. The proposed 6(d) test and proposed SP 347 are scheduled for consideration by the Sub-Committee during its December meeting. This is a meeting at which many of the explosives experts may not be in attendance, because, for many years, the common practice of the Sub-committee has been to limit discussions of explosives matters to its July meetings. Additionally, there are a number of issues that have still not been resolved by the explosives working group including acceptance criteria and confirmation that the test is valid over a broad base of 1.4S entries. There are other issues, such as how the test will be implemented, that have not yet been considered. Finally, transportation history of 1.4S articles does not indicate that there is an immediate problem (or that there ever was a problem) of accidental functioning during transport that would lead to the generation of potential hazardous effects.

9. For the reasons discussed above, IME does not believe the 6(d) test is ready for acceptance and implementation and it has urged in the past⁴, and continues to urge the Sub-committee to

³ [UN/SCETDG/33/INF.57](#)

⁴ Ibid.

commission a more thorough review of this test and other options for evaluating the effects resulting from accidental functioning and agrees with the recommendation from this past session by the expert from the USA⁵ that the Sub-committee should move "... carefully and incrementally when adopting new explosive testing methodology and criteria..." and should only adopt new tests "... after a number of corroborative experiments on reproducible samples ..." have been conducted in several countries.

Proposal

10. To avoid the need to continually review and possibly revise the 6(d) test, its applicability, and its acceptance criteria, and to allow time to consider the not yet considered issues of implementing this test, IME proposes that consideration of the proposed 6(d) test and the proposed SP 347 be postponed until the Thirty-fifth Session of the Sub-committee (July 2009), with the intent being to finalize this topic within the coming biennium.

⁵ [ST/SG/AC.10/C.3/2008/55](#), para. 1

Annex

List of 1.4S Entries

(**Red Bold Text** = SP 347 applies, *Blue Italics Text* = SP 347 does not apply)

UN No.	Name and Description
0012	<i>CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS</i>
0014	<i>CARTRIDGES FOR WEAPONS, BLANK or CARTRIDGES, SMALL ARMS, BLANK</i>
0044	<i>PRIMERS, CAP TYPE</i>
0055	<i>CASES, CARTRIDGE, EMPTY, WITH PRIMER</i>
0070	<i>CUTTERS, CABLE, EXPLOSIVE</i>
0105	<i>FUSE, SAFETY</i>
0110	<i>GRENADES, PRACTICE, hand or rifle</i>
0131	<i>LIGHTERS, FUSE</i>
0173	<i>RELEASE DEVICES, EXPLOSIVE</i>
0174	<i>RIVETS, EXPLOSIVE</i>
0193	<i>SIGNALS, RAILWAY TRACK, EXPLOSIVE</i>
0323	CARTRIDGES, POWER DEVICE
0337	<i>FIREWORKS</i>
0345	<i>PROJECTILES, inert with tracer</i>
0349	<i>ARTICLES, EXPLOSIVE, N.O.S.</i>
0366	DETONATORS FOR AMMUNITION
0367	<i>FUZES, DETONATING</i>
0368	<i>FUZES, IGNITING</i>
0373	<i>SIGNAL DEVICES, HAND</i>

UN No.	Name and Description
<i>0376</i>	<i>PRIMERS, TUBULAR</i>
<i>0384</i>	<i>COMPONENTS, EXPLOSIVE TRAIN, N.O.S.</i>
<i>0404</i>	<i>FLARES, AERIAL</i>
<i>0405</i>	<i>CARTRIDGES, SIGNAL</i>
<i>0432</i>	<i>ARTICLES, PYROTECHNIC for technical purposes</i>
0441	CHARGES, SHAPED, without detonator
0445	CHARGES, EXPLOSIVE, COMMERCIAL without detonator
<i>0454</i>	<i>IGNITERS</i>
0455	DETONATORS, NON-ELECTRIC for blasting
0456	DETONATORS, ELECTRIC for blasting
0460	CHARGES, BURSTING, PLASTICS BONDED
<i>0481</i>	<i>SUBSTANCES, EXPLOSIVE, N.O.S.</i>
0500	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
<i>0506</i>	<i>SIGNALS, DISTRESS, ship</i>
<i>0507</i>	<i>SIGNALS, SMOKE</i>
