



**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****Sub-Committee of Experts on the Globally Harmonized
System of Classification and Labelling of Chemicals****Forty-ninth session****Thirty-first session**

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Item 2 (h) of the provisional agenda

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**Explosives and related matters: Review of Chapter
2.1 of the GHS****Joint work with the Sub-Committee of Experts on the
Transport of Dangerous Goods (TDG Sub-Committee)****Review of Chapter 2.1 of the GHS****Submitted by the Australian Explosives Industry and Safety Group Inc.
(AEISG)¹****Introduction**

1. This document is a preliminary presentation of the issues the Working Group on Explosives is considering as it reviews Chapter 2.1 of GHS. It attempts to address all the issues proposed by Australia in documents ST/SG/AC.10/C.4/2014/15 and ST/SG/AC.10/C.3/2014/79, which was essentially a complete review of Chapter 2.1 to identify and rectify implementation issues that have arisen in the twenty or so years since the requirements were initially drafted. This review has proceeded through email exchanges and will continue with a face to face discussion in the meeting of the International Group of Experts on the explosion risks of unstable substances (IGUS) in April 2016. Following the IGUS meeting, draft text will be developed for discussion as an informal paper at the Working Group on Explosives in June 2016. The informal document will be circulated to the GHS and TDG sub-committees.

2. This document complements the work being done by Sweden on Chapter 2.1, on the three workstreams described in informal document INF.13 (GHS, 29th session).

¹ In accordance with the programme of work of the Sub-Committee for 2015–2016 approved by the Committee at its seventh session (see ST/SG/AC.10/C.4/56, annex III and ST/SG/AC.10/42, para. 15).

Issues to be resolved

Issue 1: Definitions

3. **Clarify:** Pyrotechnic substances are defined as non-detonating. However, flash powder is a pyrotechnic substance and it will detonate. In the fireworks default classification table we have numerous “pyrotechnic articles” that have flash powder in them.
4. To be resolved: Is flash powder outside the scope of a pyrotechnic substance because it may detonate?

Issue 2: definitions

5. **Clarify:** The definitions are unchanged from the Model Regulations, however part (c) of the definitions is based on the intended use or source of the substance.
6. To be resolved: what is the intent of defining explosives in terms of their intended use or their source? How do we manage things like aluminium tube manufactured to fabricate a detonator; is it an explosive article? Likewise, is ammonium nitrate manufactured to be used to make ammonium nitrate emulsion (ANE) an explosive? Or, is ANE an explosive because it is made to create an explosive?
7. Comment: The current definition has been in the Model Regulations for decades. Has it caused any problems? Do we need to change?

Issue 3: Label elements Table 2.1.2

8. **Clarify:** Some reference needs to be made to the position that labelling requirements for explosives shall be limited to the explosive characteristic. The speed of reaction of explosives makes it of academic interest only whether they have functioned as a mass explosion or a projectile. In addition, there is little point for the labelling requirements for nitroglycerin based explosives to warn people of the health effects, or that the material may mass explode. (This information could be reserved for the Safety Data Sheet).
9. To be resolved: The labelling elements in Table 2.1.2 of GHS.

Issue 4: Classification criteria 2.1.2.1 (a)

10. An anomaly has been identified in the different classification criteria for Division 1.1 explosives used in transport of dangerous goods (2.1.1.4 (a) and GHS (2.1.2.1 (a)). The former refers to the explosion (of) the entire load; the latter refers to the explosion (of) the entire quantity present. Logically, if the amount present (in a test sample of one safety cartridge for example) all shoots at one go, then the material is hazard division 1.1. So we have a logical inconsistency in the definition which does not exist with the definition where reference is made to the entire load.
11. To be resolved: the definition of Division 1.1 explosives with respect to transport and GHS. This may well be a translation problem, however it needs to be resolved.

Issue 5: Unstable explosives, processing and the applicability of GHS

12. The Working Group on Explosives has considered the concept of risk analysis and managing explosives in processing operations. Two options are being considered in working group drafts however neither is good enough; the issue needs further work.

13. Part of the issue turns on the concept of “unstable” explosives, which possibly arose from the original drafters of Chapter 2.1 of GHS translating “explosives too dangerous (sensitive) to transport” from the Model Regulations. Earlier drafts considered by the Working Group on Explosives in this area introduced the concept of steady state and non-steady state explosives, but this too has its limitations.

14. It has been suggested that the term “unstable explosives” be broadened (or delimited) to “Explosives not in transport configuration”.

15. This has a lot of merit as “unstable explosives” don’t exist except perhaps in a reaction vessel and very sensitive explosives may be very stable but present extreme risks to users.

16. To be resolved: clarification of the terms “unstable” and “insensitive” for explosives labelling purposes and the scope of application of GHS with respect to processing operations.

Issue 6: Criteria for explosives (current table 2.1.1)

17. Every chapter for every hazard class in the GHS includes a table setting out the criteria that define the hazard categories. The table for explosives (table 2.1.1) defines the criteria only in terms of a core set of tests which are incomplete and changing and adds only confusion to the criteria contained in the definitions for each division.

18. Clarify: Does the table add any value; might it be deleted and might the criteria be limited to what is in the definitions? Will its deletion adversely affect the style of the GHS document?

19. Clarify: Will deletion of the table generate any subsequent problems with respect to unstable explosives and those too insensitive to transport?

Issue 7: Hazard communication (2.1.3)

20. The current hazard statements have numerous anomalies which are being addressed in the work being led by Sweden. Several elements are being put forward in this debate:

21. To be resolved: The label elements in Table 2.1.2

(a) With regards to the hazard divisions: these divisions have no meaning outside transport (and perhaps storage in some jurisdictions, but not globally). The current state of discussion actually deals with inner packages, which is already one step away from the transport situation. Once the explosive is outside the inner packaging no clear distinction on hazard division can be made anymore.

(b) There seems little point telling people whether they will be injured/killed by blast, shrapnel or intense heat as they would not have to treat the explosive differently. Instructions for storage such as segregation and separation will be on the Safety Data Sheet.

- (c) Another example could be small inner packages of propellant: inside the transport packaging they can be 1.3 or 1.4, but taken out of the box (packaging) they could show “mass explosion-like” behaviour.
- (d) Detonators present a particularly unusual case: depending on the packaging they occur in 1.1B; 1.2B; 1.4B and 1.4S. But outside the packaging they all behave the same. And the common hazard is “explosive”.
- (e) The example of shaped charges is also relevant: in transport the cavities have to face each other, outside the packaging that is not the case anymore. So the hazard division will change but not the intrinsic hazard of explosive.
- (f) The hazard symbols for 1.5 and 1.6 are different from 1.1 yet the hazards are identical.
- (g) The hazard statements for Division 1.4 need scrutiny and clarification as the scope of articles in Division 1.4 is extremely broad and so are the hazards.

Issue 8: The decision logics in Figures 2.1.1 – 2.1.4

- 22. The introduction of the concept of risk analysis and managing explosives in processing lends itself to a higher level flow chart that could obviate the need to duplicate the figures that are already in the Manual of Tests and Criteria.
 - 23. To be resolved: the needs of users of GHS with respect to the decision logic flow charts. Can a simpler flow chart lead users to the information they need?
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