

Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals

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Item 2 (b) of the provisional agenda

Recommendations made by the Sub-Committee on its fifty-first, fifty-second and fifty-third sessions and pending issues: explosives and related matters

Sub-Committee of Experts on the Globally Harmonized System of Classification and Labelling of Chemicals

Thirty-sixth session

Geneva, 5-7 December 2018

Item 3 (b) of the provisional agenda

Classification criteria and related hazard communication: review of Chapter 2.1

Status report on the review of Chapter 2.1 of the GHS

Transmitted by the expert from Sweden

1. The work on the review of Chapter 2.1 of the GHS has been on-going for some years and is now in a phase where a potential new classification system has found general acceptance in the SCEGHS. Lately the main focus has been on fine-tuning the criteria for the system, as it was requested by the SCEGHS at its 35:th session that these be settled within the current biennium¹. In the next biennium the attention would then shift to developing a new Chapter 2.1, with the aim of implementing it into the 9:th revised edition of the Purple Book.
2. The work is done within an Informal Correspondence Group (ICG) led by the expert from Sweden, that cooperates with the Working Group on Explosives (EWG) on developing the technical criteria. Status reports on the work have been submitted to both Subcommittees continuously over this biennium.² These reports reveal that a lot of effort has been devoted to the development of the potential new system and the expert from Sweden is thankful for the persistent dedication of many experts within the ICG and the EWG.
3. In working document 20 to the 36:th SCEGHS (WD20)³, criteria for the new system are proposed in the form of flowcharts contained in three Annexes. The flowchart in Annex 1 contains the criteria for deciding on whether a substance, mixture or article is an Explosive. Annex 2 presents the criteria for Sub-categories 2A-C, which have been further refined by experts from the United States in informal document 10 to the 36:th SCEGHS (INF.10)⁴. These experts have also developed several illustrative examples of how their proposed criteria are to be used in practice in informal document 18 to the SCEGHS (INF.18)⁵. Annex 3 of WD20 presents the additional possibility of splitting Category 1 into two sub-categories – an issue that is further discussed below.

¹ Report from the 35:th session of the SCEGHS, [ST/SG/AC.10/C.4/70](#), paragraphs 24-27

² See [UN/SCEGHS/35/INF.16 - UN/SCETDG/53/INF.46](#), [UN/SCEGHS/34/INF.10 - UN/SCETDG/52/INF.20](#) and [UN/SCEGHS/33/INF.07 - UN/SCETDG/51/INF.15](#).

³ WD85 to the 54:th SCETDG, [ST/SG/AC.10/C.4/2018/20 - ST/SG/AC.10/C.3/2018/85](#)

⁴ INF.13 to the 54:th SCETDG, [UN/SCEGHS/36/INF.10 - UN/SCETDG/54/INF.13](#)

⁵ INF.24 to the 54:th SCETDG, [UN/SCEGHS/36/INF.18 - UN/SCETDG/54/INF.24](#)

4. At this stage there are two main open issues that still need to be resolved in order to be able to settle on the criteria. They have been discussed within the ICG since WD20 was submitted, albeit to various degrees. However, further discussion is needed in order to reach agreement within the group. To facilitate the participation of all concerned, these open issues are explained in some detail below.

Open issue 1 - the fate of energetic samples

5. When Chapter 2.1 of the GHS was discussed at the meeting of the EWG during the 53:rd SCETDG, it was noted in the minutes that “*Some consideration may also be required to categorize very small amounts of materials that have not yet been characterized.*”⁶ What was pointed out in this context is that for samples in the research and development phase there may not be enough material present to perform all the prescribed tests for Explosives. Frequently only a few grams exist in total at this stage e.g. for candidate molecules for pharmaceutical or crop protection purposes.

6. For substances that are not manufactured with the view of producing an explosive or pyrotechnic effect, but where screening procedures⁷ cannot rule out that they may have explosive properties, performing Test Series 2 is required⁸. In particular Test 2(a), the UN Gap Test, poses a challenge as it typically requires more than a kilogram of sample. Furthermore, if the result is negative, the material is scattered around the test facility, which poses a hazard to the personnel cleaning up afterwards if the substance is biologically active (e.g. a pharmaceutical or crop protection type of molecule).

7. Recognising the problem⁹, a small group of experts¹⁰ met and discussed under what conditions performing the full Test Series 2, in particular Test 2(a), could be avoided. The group came to the suggestion to add a note to Box 5 of the flowchart in Annex 1 of WD20 reading:

Substances in the research and development phase for which not enough material exists to perform Test Series 2 may be regarded as Self-reactive substances and mixtures Type C, provided that:

- *The decomposition energy of the substance is less than 2000 J/g; and*
- *The result in Test 3(a) and Test 3(b) is negative; and*
- *The result in Test 2(b) is “no explosion” at an orifice diameter of 6 mm; and*
- *The expansion of the lead block in Test F.3 is less than 100 ml per 10 gram substance.*¹¹

Under these circumstances the answer to Box 5 would thus be considered to be “Yes”, directing to the classification result “Not an Explosive”. Consequently the substance would instead be classified in the GHS as a Self-reactive substance or mixture Type C.

8. The criterion on decomposition energy above (i.e. the 2000 J/g limit) has been derived from analysing a large amount of energetic samples and comparing them with typical explosives. The result is displayed in Figure 3 of WD78 from CEFIC to the 54:th SCETDG, that addresses the related problem of classifying energetic samples for transport. Any solution in the GHS-context should be harmonised with transport to the extent possible.

⁶ Paragraph 18 in the report of the EWG, INF.67 to the 53:rd SCETDG, [UN/SCETDG/53/INF.67](#).

⁷ See section 2.1.4.2 of Chapter 2.1 of the GHS (7:th revised edition).

⁸ See the flowchart in Annex 1 of WD20.

⁹ It should be noted that this is not a problem introduced by the new classification system under discussion.

¹⁰ Including the expert from Sweden and the Chairman of the EWG.

¹¹ Test F.3 is the so called BAM Trauzl test that is used to measure the explosive power of organic peroxides and self-reactive substances as part of their classification procedures according to the GHS.

Open issue 2 - the splitting or not of Category 1

9. As also presented in WD20, the issue on whether the proposed Category 1 should be split into two sub-categories (1A and 1B) poses a challenge as views go apart within the ICG. Despite intersessional discussions no consensus has been found as of yet and further thought needs to be given to the matter. These discussions have, however, led to a better understanding of the core of the divergence, which should provide a basis for an sound resolution eventually.

10. To begin with, views go apart regarding the criteria for the already existing GHS-classification “Unstable explosives”. Some experts argue that the criteria for this classification for substances and mixtures is a positive result in at least one of the tests within Test Series 3 (or in the case of ANE-candidates Test 8(a)) or possibly in any other suitable test(s). Other experts, on the contrary, are of the view that “Unstable explosives” are simply all Explosives that have not been assigned a Division (for transport) and that Test Series 3 is intended for transport purposes only. Considering these differences around the existing classification criteria it is no surprise that the views on the splitting of Category 1 go apart.

11. If the issue of the existing criteria for “Unstable explosives” is set aside, focus can be directed towards the principal usefulness of separating “highly sensitive” explosives into a separate Sub-category 1A, leaving other Explosives in Sub-category 1B (unless they can be assigned to Category 2 of course). To this point it has been argued by some that such a separation would make it possible to assign separate hazard communication elements to Sub-category 1A which would flag up the sensitivity to users of these Explosives. Others, however, have argued that the distinction of what is “highly sensitive” (as determined by Tests Series 3 or in any other way) is somewhat arbitrary and the separation could give the misleading perception that Explosives in Sub-category 1B are somehow “safe”. In this spirit it has also been argued that those handling explosives in manufacturing, processing and similar situations must always have knowledge about their inherent hazardous properties as part of their risk-assessments anyhow and that no simple (set of) criteria can substitute for this.

12. While some attempts have been made to find intermediate solutions to overcome these diverging views, for instance to provide information on sensitivity in safety data sheets in case tests (such as Test Series 3) have been performed on a voluntary basis, it is difficult at this point to see how this issue can be resolved within the current biennium. The expert from Sweden thus predicts that the discussions around Category 1 will have to continue into the next biennium, although an attempt to resolve the matter will of course be made during the November/December 2018 Sub-committee meetings.

Upcoming meetings

13. As has been the case throughout the biennium, two dedicated meetings of the ICG on Chapter 2.1 are foreseen in November/December 2018. The first meeting will presumably be held jointly with the EWG on Thursday the 29:th of November in meeting room S4.¹² This meeting will focus on finding agreement on the technical criteria for the new classification system and on the path forward for any remaining issues (e.g. that of Category 1).

14. The second meeting is scheduled to take place in the evening of Wednesday the 5:th of December, starting 17:30, also that in meeting room S4.¹³ This meeting will seek to consolidate the criteria of the system that hopefully emerge from the first meeting. It will also discuss the path forward, including any updates of the Terms of Reference and/or the Programme of Work for the next biennium. If time permits, also other aspects of a new Chapter 2.1 such as hazard communication may be brought up.

¹² Pending the decision of the SCETDG. See INF.17 to the 54:th SCETDG, [UN/SCETDG/54/INF.17](#)

¹³ See INF.13 to the 36:th SCEGHS, [UN/SCEGHS/36/INF.13](#)