

**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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**Sub-Committee of Experts on the
Transport of Dangerous Goods**

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Item 10 (g) of the provisional agenda

**Issues relating to the Globally Harmonized System
of Classification and Labelling of Chemicals**

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

Twenty-ninth session

Geneva, 29 June – 1 July 2015

Item 2 (d) of the provisional agenda

**Classification criteria and related hazard
communication: use of the Manual of Tests and
Criteria in the context of the GHS**

**Comments on the use of the Manual of Tests and Criteria in
the context of the GHS: Introduction of the Manual**

Transmitted by the expert from Canada

Background

1. The Sub-Committee agreed during its forty-sixth session to review the Manual of Tests and Criteria in the context of GHS in accordance with the mandate described in INF.44 (TDG, 46th session) – INF.19 (GHS, 28th session). Delegations were once again encouraged to submit their comments in writing on the following documents submitted for the forty-fifth session by the secretariat: ST/SG/AC.10/C.3/2014/61–ST/SG/AC.10/C.4/2014/8 as well as INF.8 (TDG, 45th session) and its Addendums 1-5. (See report for reference ST/SG/AC.10/C.3/90, paragraphs 34-37 and ST/SG/AC.10/C.3/92, paragraphs 93-94).

2. Like the expert from the Netherlands in informal document INF.6 (TDG, 47th session), the experts from Canada wish to share the results of their review of these documents. The issues mentioned in paragraph 8 of ST/SG/AC.10/C.3/2014/61–ST/SG/AC.10/C.4/2014/8 will be commented upon as will the Introduction to the Manual (informal document INF.8 (TDG-45th session) – informal document INF.5 (GHS-27th session). Remarks and editorial suggestions are not in order of importance, but are provided as they appear. The experts from Canada will continue their review of the following papers over the course of the biennium.

3. Reference to current text is to the 5th edition of the Manual, including its revisions, unless noted otherwise. Reference to proposed text is meant as coming from informal document INF.8 (45th session) – informal document INF.5 (GHS-27th session) from the Secretariat.

Discussion

4. The experts from Canada understand the need to introduce text in the Manual explaining the relationship between the Model Regulations and the GHS, and agree with the suggested text. However, the original purpose of the Manual was to “give descriptions

of the test methods and procedures considered to be the most useful for providing competent authorities with the necessary information to arrive at a proper classification of substances and articles for transport” (see current 1.1.1 of the Manual). For this reason and for consistency purposes, it is believed the Model Regulations should always be recognized first, before the GHS, throughout the Manual, as seen in the proposed 1.1.2.

5. The GHS refers to “transport, workplace and consumer sectors” in section 1.1.2.6.2.1. It is suggested to use the same terms rather than referring to “transport, storage, handling and supply and use sectors” when their use is necessary as seen here in the proposed 1.1.1. Similarly to the comment from the Netherlands expert in paragraph 6 of INF.6 (TDG, 47th Session), it is also suggested to remove all references to sectors and adding a note stating that the Manual applies to all sectors, unless noted otherwise.

“1.1.1 The purpose of this text is to present the United Nations schemes for the classification of certain types of dangerous goods and to give descriptions of the test methods and procedures considered to be the most useful for providing competent authorities with the necessary information to arrive at a proper classification of substances, mixtures and articles for transport, workplace and consumer sectors ~~transport, storage, handling and supply and use sectors.~~”

6. It is suggested to indicate in the proposed 1.1.3 that the Manual of Tests and Criteria is “hereafter referred to as the Manual” since it is mentioned for the Recommendations, the Model Regulations and the GHS in the proposed 1.1.2.

7. Since the Model Regulations and the GHS don’t consistently use the same terminology, it is suggested, as does the expert from the Netherlands in paragraph 5 of INF.6 (TDG, 47th Session), that further work is needed to increase consistency in that area. The Model Regulations mostly use “substances” for both “substances” and “mixtures”. The GHS differentiates between “substances” and “mixtures”; while “solutions” and “preparations” are considered “mixtures” in the GHS.

It is thus suggested that the terms “substances and mixtures” be used throughout the Manual anytime the term “substances” was used alone, if appropriate. A note could be included in the introduction to explain the meaning of these terms in the context of the Manual.

8. It is suggested to amend the sections that explain the hazard classes in the Model Regulations and the GHS in the same style so they are more consistent (see proposed sections 1.2.1.1 and 1.2.2). The proposed references to numerical or alphabetical values were not kept in the text, as compatibility groups for explosives vary from what was proposed and this would add confusion. It is also suggested to add a list of all the classes and divisions after 1.2.1.1, such as the one found in paragraph 2.0.1.1 of the Model Regulations, as well as the last sentence from the introductory paragraph in 2.0.1.1.

“1.2.1 Hazard classes in the Model Regulations

1.2.1.1 The Model Regulations address classification of substances, mixtures, and articles according to the hazard or the most predominant of the hazards they present for transport. The Model Regulations define 9 numbered hazard classes (see below). Some of these classes are subdivided into divisions addressing a more specific type of hazard within a given class. The numerical order of the classes and divisions is not that of the degree of danger. These classes and divisions are:

- Class 1 Explosives**
- Division 1.1 Substances and articles which have a mass explosion hazard
 - Division 1.2 Substances and articles which have a projection hazard but not a mass explosion hazard
 - Division 1.3 Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both but not a mass explosion hazard
 - Division 1.4 Substances and articles which have a no significant hazard beyond the package in the event of ignition or initiation during transport
 - Division 1.5 Very insensitive substances which have a mass explosion hazard
 - Division 1.6 Extremely insensitive articles which do not have a mass explosion hazard
- Class 2 Gases**
- Division 2.1 Flammable gases
 - Division 2.2 Non-flammable, non-toxic gases
 - Division 2.3 Toxic gases
- Class 3 Flammable Liquids**
- Class 4 Flammable solids; substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases**
- Division 4.1 Flammable solids
 - Division 4.2 Substances liable to spontaneous combustion
 - Division 4.3 Substances which, on contact with water emit flammable gases
- Class 5 Oxidizing substances and organic peroxides**
- Division 5.1 Oxidizing substances
 - Division 5.2 Organic peroxides
- Class 6 Toxic and infectious substances**
- Class 7 Radioactive materials**
- Class 8 Corrosive substances**
- Class 9 Miscellaneous dangerous substances and articles, including environmentally hazardous substances”**

9. In agreement with the expert from the Netherlands, it is suggested that the proposed Table 1.1 be revised to also include the GHS hazard classes that are outside the scope of the Model Regulations. It is also suggested to take advantage of that table to allow for a complete overview of the relationship between TDG/GHS hazard classes. Last, it is proposed to add a new paragraph 1.2.2.2 for a quick reference to the table. The table, which we propose to insert after the proposed 1.2.3.3, is further described in item 14.

“1.2.2 Hazard classes in the GHS

1.2.2.1 The GHS addresses classification of substances, solutions and mixtures according to the by type of hazards they present in the storage, handling and supply and use sectors (e.g. physical, health and environmental hazards). The GHS classes are not numbered, but some of the GHS hazard classes are subdivided into hazard categories indicating the severity of the hazard, with Category 1 indicating the most severe hazard.

1.2.2.2 The complete list of GHS hazard classes can be found in Table 1.1.”

10. Most dangerous goods are assigned to packing groups, not just “some”. As such, it is suggested to rewrite the first sentence of proposed section 1.2.1.2 and describe the type of danger represented as follows. Also, it is suggested to remove the last sentence about articles and include the explanation in the first sentence.

“1.2.1.2 In addition, for packing purposes, most ~~some~~ dangerous goods, excluding gases and articles, are assigned to one of three packing groups in accordance with the degree of danger they present:

Packing group I: Substances presenting high danger;
Packing group II: Substances presenting medium danger; and
Packing group III: Substances presenting low danger.

The packing group to which a substance or mixture is assigned is indicated in the Dangerous Goods List in Chapter 3.2 of the Model Regulations. ~~Articles are not assigned to packing groups.”~~

11. It is suggested to add paragraph 2.0.1.5 from the Model Regulations as an introduction to 1.2.1.3 so that the information flows better and to amend the existing text as follows:

“1.2.1.3 Dangerous goods presenting a danger of a single class and division are assigned to that class and division and subsequently, the degree of danger (packing group), if applicable, determined. When an article or substance is specifically listed by name in the Dangerous Goods List in Chapter 3.2 of the Model Regulations, its class or division, its subsidiary risk(s) and, when applicable, its packing group are taken from this list. Articles are not assigned to packing groups.

Dangerous goods meeting the ~~defining~~ criteria of more than one hazard class or division ~~that which~~ are not listed in the Dangerous Goods List are assigned to a transport class or division and subsidiary risk(s) on the basis of the precedence of hazards characteristics.”

12. It is suggested to remove all three paragraphs of proposed section 1.2.1.4 and to replace them with a short explanation of the *precedence of hazards concept* used in the Model Regulations and to refer to paragraph 2.0.3 of the Model Regulations. The current text with the proposed modifications is much too detailed for the Introduction of the Manual. It is also suggested to insert the text of the proposed 1.2.1.4.3 (including the contents of NOTES 2 and 3 from 2.4.3.1.1) into the Model Regulations under 2.0.3 as it would include all the information on this concept in one place.

13. As mentioned in INF.53 (UK, TDG 45th Session), substances and mixtures of Class 4 can actually be found in six individual GHS hazard classes, not five (proposed paragraph

1.2.3.2). For consistency purposes, it is also suggested to amend the way the reference is introduced, as follows:

“1.2.3.2 In addition, while one transport class may cover different types of hazards, GHS hazard classes usually address one hazard each. For instance, substances and mixtures of Class 4 in transport belong to six individual GHS hazard classes. Also, while transport classes are identified by a number (~~Classes 1 to 9~~), GHS hazard classes are identified by type of hazard and are not numbered. Moreover, the concept of precedence of hazards as defined in paragraph 1.1.4.1.4 of the Model Regulations does not exist in the GHS.”

14. It is suggested to modify the proposed 1.2.3.3 to better reflect the content of Table 1.1 as proposed in item 9. The experts from Canada agree with the expert from Netherlands that adding an overview of the relationship between GHS and transport classifications would increase the transparency and user-friendliness of the Manual (INF.6, TDG 47th Session). The descriptions of the transport classes have been kept out of this table so as not to make it too cumbersome and it is suggested they be listed under 1.2.1.1 instead.

“1.2.3.3 The complete list of GHS hazards classes can be found in Table 1.1. This table also contains the correspondence between hazard classes in the GHS and those found in the Model Regulations.”

“Table 1.1:

Correspondence between GHS hazards addressed in the Model Regulations and transport classes
GHS hazard classes and their correspondence with the Model Regulations”

Types of hazards	GHS hazard classes	Model Regulations hazard classes
Physical	Explosives	Class 1
	Flammable gases (including chemically unstable gases)	Class 2
	Aerosols	
	Oxidizing gases	
	Gases under pressure	
	Flammable liquids	
	Flammable solids	Class 3
	Self-reactive substances and mixtures	Class 4
	Pyrophoric liquids	
	Pyrophoric solids	
	Self-heating substances and mixtures	
	Substances and mixtures which, in contact with water, emit flammable gases	
	Oxidizing liquids	Class 5
	Oxidizing solids	
	Organic peroxides	
Corrosive to metals	Class 8	
Health	Acute toxicity	Classes 2 and 6
	Skin corrosion/irritation	Class 8
	Serious eye damage/eye irritation	Not dangerous goods for transport purposes
	Respiratory or skin sensitisation	
	Germ cell mutagenicity	
	Carcinogenicity	
	Reproductive toxicity	
	Specific target organ systemic toxicity – Single	

	exposure	
	Specific target organ systemic toxicity – Repeated exposure	
	Aspiration hazard	
Environment	Hazardous to the aquatic environment (Acute 1 and Chronic 1 and 2)	Class 9
	Hazardous to the aquatic environment (Acute 2 and 3, Chronic 3 and 4)	Not dangerous goods for transport purposes
	Hazardous to the ozone layer	

15. In the same opinion as paragraph 5, there is no need to mention “transport” before the classes when explaining the Parts of the Manual in 1.3.1 (and throughout the Manual) because when the classes are numbered, this means they are transport classes. A suggestion is to use bullets instead as shown below:

(Note: this paragraph is presented “as proposed” by the experts from Canada, as showing all the recommended changes to the current proposed text would have been confusing)

“1.3.1 The classification procedures, test methods and criteria are divided into three parts depending on the hazards addressed.

Part I - Explosives

Part II - Self-reactive substances and mixtures
 - Organic peroxides and “mixtures of”

Part III - Gases and aerosols
 - Desensitized explosives
 - Flammable and pyrophoric liquids and solids
 - Substances and mixtures which in contact with water emit flammable gases
 - Oxidizing substances
 - Corrosives to metal
 - Environmentally hazardous substances”

16. The Secretariat asks why the sentence under 1.3.1 (shown below) only refers to Part III, since Parts I and II also contain such classification procedures, test methods and criteria also given in the Model Regulations and in the GHS. The experts from Canada raise the same issue. It is suggested to remove this sentence to eliminate duplication of information as much as possible between the Model Regulations, the GHS and the Manual.

“Part III contains some classification procedures, test methods and criteria which are also given in the Model Regulations and in the GHS.”

17. It is suggested to add a sentence (new proposed paragraph 1.3.4) as shown below to explain how figures are numbered.

“1.3.5 When figures such as diagrams of apparatus or their assembly are referenced in test methods, they are identified as follows:

Figures x.1, x.2, x.3 etc. (i.e. diagrams of apparatus etc.)”

18. It is believed that sections 1.5.2 and 1.5.4 are areas of the *Introduction to the Manual* where sectors have to be referenced.

(Only the first sentence of each section is shown below as proposed by the experts from Canada).

“1.5.2 The composition of the test sample should be as close as possible to the concentration of the substance or mixture intended for transport, storage, handling or supply and use.”

“1.5.4 The tests should be performed under the conditions (temperature, density etc.) which are representative of the expected circumstances of transport, storage, handling or supply and use, as applicable.”

Conclusion

19. The experts from Canada invite members of both sub-committees to consider their suggestions for inclusion in the 7th revised of the Manual as the 6th revised edition should be released later this year. As mentioned earlier, the experts from Canada will continue their review of the Manual during the course of the biennium, using the documents submitted by the Secretariat at the 45th session of the TDG Sub-Committee and referenced at the beginning of this paper.
