



**WORKING PAPER**

**DANGEROUS GOODS PANEL (DGP)  
WORKING GROUP MEETING (DGP-WG/15)**

**Montreal, 27 April to 1 May 2015**

**Agenda Item 2: Development of recommendations for amendments to the *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284) for incorporation in the 2017-2018 Edition**

**2.2: Part 2 — Classification**

**CLASSIFICATION AND ALIGNMENT WITH UN MODEL REGULATIONS**

(Presented by B. Firkins)

**SUMMARY**

In reviewing the criteria for classification in the ICAO Technical Instructions, it was observed that there were a number of subtle, but distinctive differences between the Technical Instructions and the UN Model Regulations.

**Action by the DGP-WG:** The DGP is invited to consider the rationale (if any) by which these changes came about; whether the terms in the Technical Instructions ought to be aligned with the UN Model Regulations; and if so, how this might be affected.

**1. INTRODUCTION**

1.1 In reviewing the criteria for classification in the ICAO Technical Instructions, it was observed that there were a number of subtle, but distinctive differences between the Technical Instructions and the UN Model Regulations.

1.2 Within the Technical Instructions, many of the classification criteria are preceded with the word “**should**” whilst in the UN Model Regulations, the same classification criteria are prefaced with “**shall**”

1.3 These differences have been encapsulated in the appendix to this paper.

**2. DISCUSSION**

2.1 The following arguments have been put forward to facilitate the panel’s discussion:

2.1.1 For international harmonization, the Technical Instructions ought to be consistent with the UN Model Regulations.

2.1.2 Where there are unique challenges encountered in aviation, then the Technical Instructions ought to be more restrictive than the UN Model Regulations.

2.1.3 Where the Technical Instructions are less restrictive than the UN Model Regulations, then it gives an appearance that the aviation mode of transport is more flexible and permits more leeway than that envisaged by the UN Model Regulations.

2.1.4 When there is inconsistency between the UN Model Regulations and the Technical Instructions, then the more restrictive provisions ought to apply. This argument presupposes that the less restrictive differences in the Technical Instructions are immaterial and the substance will already be classified according to more restrictive provisions in Regulations.

2.1.5 The UN Model Regulations are only a “Recommendation”. States may choose to apply different classification criteria for their national system of classification, which may be either more restrictive or less restrictive.

2.2 The following text is from Page 2 of the UN Model Regulations — “PRINCIPLES UNDERLYING THE REGULATION OF THE TRANSPORT OF DANGEROUS GOODS”. This text indicates that classification is a flexible approach and the UN criteria ought to be used as guidance.

*7. The objective of the recommended definitions is to indicate which goods are dangerous and in which class, according to their specific characteristics, they should be included. These definitions have been devised so as to provide a common pattern which it should prove possible to follow in the various national and international regulations. Used with the list of dangerous goods, the definitions should provide guidance to those who have to use such regulations; and they present a notable degree of standardization while retaining a flexibility that allows diverse situations to be taken into account.*

2.3 The following text is from Page 2 of the UN Model Regulations — “NATURE, PURPOSE AND SIGNIFICANCE OF THE RECOMMENDATIONS” Whilst this text clearly shows that the UN Model Regulations are recommendatory in nature, in the interests of safety, harmonization and reduction in administrative burden; many requirements will appear as being mandatory, in order to facilitate the direct use of the Model Regulations as a basis for International and national transport regulations.

*2. The recommendations concerning the transport of dangerous goods are presented in the form of “Model Regulations on the Transport of Dangerous Goods”, which are presented as an annex to this document. The Model Regulations aim at presenting a basic scheme of provisions that will allow uniform development of national and international regulations governing the various modes of transport; yet they remain flexible enough to accommodate any special requirements that might have to be met. It is expected that governments, intergovernmental organizations and other international organizations, when revising or developing regulations for which they are responsible, will conform to the principles laid down in these Model Regulations, thus contributing to worldwide harmonization in this field. Furthermore, the new structure, format and content should be followed to the greatest extent possible in order to create a more user-friendly approach, to*

*facilitate the work of enforcement bodies and to reduce the administrative burden. Although only a recommendation, the Model Regulations have been drafted in the mandatory sense (i.e., the word “shall” is employed throughout the text rather than “should”) in order to facilitate direct use of the Model Regulations as a basis for national and international transport regulations....*

2.4 Where there is a difference between the Technical Instructions and the UN Model Regulations, then there ought to be a consistency in those differences.

2.5 There are a number of classification criteria in the Technical Instructions which contain the same “mandatory” intent as the UN Model Regulations; and a similar number where the Technical Instructions appear to be less restrictive.

2.6 The argument around consistency in the Technical Instructions would lead to two alternative options:

- a) The mandatory (“must” and “shall”) classification criteria in the Technical Instructions are changed to “should”. This would fit in with the concept of the UN Model Regulations being a global advisory framework; or
- b) The optional (“should”) classification criteria are amended in the Technical Instructions to correspond with the mandatory text in the UN Model Regulations. This would conform to the desire of the UN to develop harmonized and consistent global approach with dangerous goods.

2.7 Some States may consider that domestic classification criteria, possibly enshrined in legislation, should continue, or cannot be amended in time for the introduction of the Technical Instructions in 2017.

2.8 As the UN Committee of Experts is finalising the 19<sup>th</sup> Edition of the Model Regulations, perhaps the time has come for ICAO, as a specialized agency of the UN, to indicate a commitment towards global harmonization on classification by the 20<sup>th</sup> Edition.

### 3. ACTION BY THE DGP-WG

3.1 The DGP-WG is invited to comment upon the issues raised within this paper.

3.2 The DGP is invited to consider the rationale (if any) by which these changes came about; whether the terms in the Technical Instructions ought to be aligned with the UN Model Regulations and if so, how this might be affected.

3.3 Depending upon the guidance and feedback from the DGP, where there is value and merit, a further proposal may be brought to DGP/25.

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APPENDIX

THE DIFFERENCES BETWEEN ICAO TECHNICAL INSTRUCTION AND UN MODEL REGULATIONS

| Item | Page  | ICAO Part;<br>Para                   | Current Text in the Technical<br>Instructions  | UN Para   | Current Text in the UN Model<br>Regulations  | Comments                         |
|------|-------|--------------------------------------|--|-----------|--|----------------------------------|
| 1    | 2-0-1 | 2;Introductory<br>Chapter, 1.        | Classification <b>must</b> be made by the appropriate national authority when so required or may otherwise be made by the shipper.   | 2.0.0     | The classification <b>shall</b> be made by the appropriate competent authority when so required or may otherwise be made by the consignor.   | Consistent — Mandatory           |
| 2    | 2-0-1 | 2;<br>2;Introductory<br>Chapter, 2.3 | Wastes <b>must</b> be transported under the requirements of the appropriate class considering their hazards and the criteria in these Instructions.  | 2.0.1.2.1 | Wastes <b>shall</b> be transported under the requirements of the appropriate class considering their hazards and the criteria in these Regulations.  | Consistent — mandatory           |
| 3    | 2-0-2 | 2;Introductory<br>Chapter, 2.7       | Where a substance or article is not specifically listed by name in Table 3-1 and there are two or more hazards of Class 3, 4 or 8 or Division 5.1 or 6.1 associated with its air transport in that it meets the definition for two of those classes or divisions as shown in Part 2, Chapters 1 to 9, it <b>must</b> be classified in accordance with the precedence of hazards table (Table 2-1). | 2.0.1.6   | Dangerous goods meeting the defining criteria of more than one hazard class or division and which are not listed by name in the Dangerous Goods List, <b>are assigned</b> to a class and division and subsidiary risk(s) on the basis of the precedence of hazards in 2.0.3.                                     | Generally consistent — Mandatory |
| 4    | 2-1-5 | 2;1.5.2.2                            | Where a substance provisionally accepted into Class 1 is excluded from Class 1 by performing Test Series 6 on a specific type and size of package, this substance, when meeting the classification criteria or definition for another class or division, <b>should</b> be listed in the Dangerous Goods List ...   | 2.1.3.6.2 | Where a substance provisionally accepted into Class 1 is excluded from Class 1 by performing Test Series 6 on a specific type and size of package, this substance, when meeting the classification criteria or definition for another class or division, <b>should</b> be listed in the Dangerous Goods List ... | Consistent — recommended         |

| Item | Page  | ICAO Part;<br>Para | Current Text in the Technical<br>Instructions  | UN Para   | Current Text in the UN Model<br>Regulations  | Comments  |
|------|-------|--------------------|--|-----------|--|---|
| 5    | 2-1-5 | 2;1.5.2.3          | Where a substance is assigned to Class 1 but is diluted to be excluded from Class 1 by Test Series 6, this diluted substance (hereafter referred to as desensitized explosive) <b>should</b> be listed in the Dangerous Goods List with an indication of the highest concentration which excluded it from Class 1 (see 2;3.1.4 and 2;4.2.4) and if applicable, the concentration below which it is no longer deemed subject to these Instructions. New solid desensitized explosives subject to these Instructions <b>should</b> be listed in Division 4.1, and new liquid desensitized explosives <b>should</b> be listed in Class 3. When the desensitized explosive meets the criteria or definition for another class or division, the corresponding subsidiary risk(s) <b>should</b> be assigned to it. | 2.1.3.6.3 | Where a substance is assigned to Class 1 but is diluted to be excluded from Class 1 by Test Series 6, this diluted substance (hereafter referred to as desensitized explosive) <b>shall</b> be listed in the Dangerous Goods List of Chapter 3.2 with an indication of the highest concentration which excluded it from Class 1 (see 2.3.1.4 and 2.4.2.4.1) and if applicable, the concentration below which it is no longer deemed subject to these Regulations. New solid desensitized explosives subject to these Regulations <b>shall</b> be listed in Division 4.1 and new liquid desensitized explosives <b>shall</b> be listed in Class 3. When the desensitized explosive meets the criteria or definition for another class or division, the corresponding subsidiary risk(s) <b>shall</b> be assigned to it. | Inconsistent — Less restrictive.<br><br>The ICAO terminology is probably more relevant as the upper and lower limits for classification <b>SHOULD</b> be found in the Dangerous Goods List; it is possible that the UN or ICAO may not list them in the Dangerous Goods List. .           |
| 6    | 2-3-1 | 2;3.2.1            | Table 2-4 <b>should</b> be used for the determination of the packing group of a liquid that presents a risk due to flammability.   | 2.3.2.1   | The criteria in 2.3.2.6 <b>are used</b> to determine the hazard grouping of a liquid that presents a risk due to flammability  | Inconsistent — less restrictive.<br>Whilst different in form and appearance; the ICAO text is more around presenting the information in a table and referring to it. To achieve a consistent outcome – the ICAO text ought to mandate the criteria in Table 2-4; similar to item 3 above. |
| 7    | 2-3-1 | 2;3.2.1            | For liquids whose only hazard is flammability, the packing group for the material <b>is</b> the packing group shown in Table 2-4.  | 2.3.2.1.1 | For liquids whose only risk is flammability, the packing group for the substance <b>is</b> the hazard grouping shown in 2.3.2.6.   | Consistent — Mandatory  |
| 8    | 2-3-1 | 2;3.2.1            | For a liquid possessing an additional hazard(s), the packing group, determined by using Table 2-4, and the packing group based on the severity of the additional hazard(s), <b>must</b> be considered...   | 2.3.2.1.2 | For a liquid with additional risk(s), the hazard group determined from 2.3.2.6 and the hazard group based on the severity of the additional risk(s) <b>shall</b> be considered, ... .  | Consistent — Mandatory  |

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|------|-------|--------------------|--|------------------------|---|---|
|      | 2-3-1 | 2;3.2.1            | .... In such cases, the table of precedence of hazard characteristics appearing in Table 2-1 <b>should be used to determine</b> the correct classification of the liquid.  | 2.3.2.1.2              | ....and the classification and packing group <b>determined</b> in accordance with the provisions in Chapter 2.0   | Inconsistent – Less restrictive<br>Again, different in form and appearance; the ICAO text presents the information in a table and refers to it. To achieve a consistent outcome – the ICAO text ought to mandate the criteria in Table 2-1; similar to item 3 above   |
| 9    | 2-5-3 | 2;5.3.1.2          | Contact of organic peroxides with the eyes <b>should</b> be avoided. Some organic peroxides will cause serious injury to the cornea, even after brief contact, or will be corrosive to the skin.   | 2.5.3.1.2              | Contact of organic peroxides with the eyes <b>is to</b> be avoided. Some organic peroxides will cause serious injury to the cornea, even after brief contact, or will be corrosive to the skin  | Inconsistent – less restrictive.<br>The ICAO text is less restrictive; however, the content is either to serve as precursory text for a Corrosive hazard classification (Note 13 on Page 2-5-12); or it is for the purposes of Work Health and Safety awareness, in which case it should appear as a Note, rather than substantive text that deals with “Classification”. |
| 10   | 2-5-5 | 2;5.3.4.1          | In order to ensure safety during transport, organic peroxides are, in many cases, desensitized by organic liquids or solids, inorganic solids or water. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. In general, desensitization <b>should</b> be such that in case of spillage or fire, the organic peroxide may not concentrate to a dangerous extent. | 2.5.3.5.1 -<br>5.3.4.1 | In order to ensure safety during transport, organic peroxides are, in many cases, desensitized by organic liquids or solids, inorganic solids or water. Where a percentage of a substance is stipulated, this refers to the percentage by mass, rounded to the nearest whole number. In general, desensitization <b>shall</b> be such that in case of spillage or fire, the organic peroxide may not concentrate to a dangerous extent. | Inconsistent – Less restrictive.  |
| 11   | 2-6-1 | 2;6.2.1.3          | <i>LC<sub>50</sub> for acute toxicity on inhalation</i> is that concentration of vapour, mist or dust which, administered by continuous inhalation for one hour to both male and female young adult albino rats, is most likely to cause death within 14 days in half of the animals tested.   | 2.6.2.1.3              | <i>LC<sub>50</sub> for acute toxicity on inhalation</i> is that concentration of vapour, mist or dust which, administered by continuous inhalation for one hour to both male and female young adult albino rats, is most likely to cause death within 14 days in half of the animals tested.  | Consistent – primarily a definition rather than a requirement.  |
| 12   | 2-6-1 | 2;6.2.1.3          | A solid substance <b>should</b> be tested if at least 10 per cent (by mass) of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 µm or less.  | 2.6.2.1.3              | A solid substance <b>shall</b> be tested if at least 10 per cent (by mass) of its total mass is likely to be dust in a respirable range, e.g. the aerodynamic diameter of that particle-fraction is 10 µm or less.  | Inconsistent – less restrictive   |

| Item | Page  | ICAO Part;<br>Para | Current Text in the Technical<br>Instructions  | UN Para   | Current Text in the UN Model<br>Regulations  | Comments   |
|------|-------|--------------------|--|-----------|--|--|
| 13   | 2-6-1 | 2;6.2.1.3          | A liquid substance <b>should</b> be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90 per cent (by mass) of a specimen prepared for inhalation toxicity <b>should</b> be in the respirable range as defined above.   | 2.6.2.1.3 | A liquid substance <b>should</b> be tested if a mist is likely to be generated in a leakage of the transport containment. Both for solid and liquid substances more than 90 per cent (by mass) of a specimen prepared for inhalation toxicity <b>shall</b> be in the respirable range as defined above.  | Inconsistent – less restrictive  |
| 14   | 3-2-2 | “Column 8”         | UN packing group” — this column contains the UN packing group number (i.e. I, II or III) assigned to the article or substance. If more than one packing group is indicated for the entry, the packing group of the substance or formulation to be transported <b>should</b> be determined, based on its properties, through application of the hazard grouping criteria as provided in Part 2. | 3.2.1.    | Column 5 — UN packing group” - this column contains the UN packing group number (i.e. I, II or III) assigned to the article or substance. If more than one packing group is indicated for the entry, the packing group of the substance or formulation to be transported <b>shall</b> be determined, based on its properties, through application of the hazard grouping criteria as provided in Part 2. | Inconsistent – less restrictive<br><br>To achieve a consistent outcome – the ICAO text ought to mandate the classification criteria in Part 2. |