

ECONOMIC COMMISSION FOR EUROPE

INLAND TRANSPORT COMMITTEE

Working Party on the Transport of Dangerous Goods

Joint Meeting of the RID Safety Committee and the Working Party on the Transport of Dangerous Goods.

(Bonn, 13-17 October 2003)

SECURITY OF THE TRANSPORT OF DANGEROUS GOODS

Transmitted by the Government of the United Kingdom

Executive Summary: The UK refers to the previous discussion on security provisions during the September session of the Joint Meeting where their application to maximum total quantities per transport unit was considered.

Action to be taken: To review the application of security provisions to those goods exempted under maximum total quantities per transport unit.

Related documents: TRANS/WP15 /AC.1/2003/49 , TRANS/WP.15/AC.1/2003/58, TRANS/WP.15/AC.1/2003/61, TRANS/WP.15/AC.1/2003/64, INF 9, INF 10, INF 10/Rev 1, INF 19, INF 20, INF 26.

1. Introduction

1.0 The UK refers to discussions during the September session of the Joint Meeting where it was decided to exclude dangerous goods in quantities below the transport category thresholds per transport unit in 1.1.3.6.3 from any security requirements. This arose from a proposal from EIGA, as amended, in INF 10/Rev. 1 which expressed concern about industry's ability to meet the provisions relating to security plans for certain high consequence toxic gases. It was proposed to exclude these from the application of proposed provision 1.10.3, relating to high consequence dangerous goods, by adding the words 'Chapter 1.10.3' before 'Chapter 5.3' in 1.1.3.6.2.

- 1.1 However, during debate, the Joint Meeting agreed to widen the scope of this dis-application by adopting a new provision 1.10.4 *'Provisions in 1.10.1, 1.10.2 and 1.10.3 need not be applied when the quantities in each transport unit are smaller than those referred to in 1.1.3.6, 2.2.7.1.2 and in Chapters 3.3. and 3.4.'* In addition to the previously agreed exemption for dangerous goods packed in limited quantities, this text has the effect of exempting all dangerous goods from any security provisions in quantities below the maximum total quantity per transport unit.
- 1.2 In reaching this decision, no detailed consideration was given to the range of substances so exempted. The UK has since identified those high consequence dangerous goods that have been exempted from any security provisions. These are shown in Annex A attached. The UK believes it would be wholly inappropriate to exclude, for example, such highly toxic gases as phosgene (UN 1076) in quantities below 20 kg or chlorine (UN 1017) in quantities below 50kg from the high consequence dangerous goods list. Similarly exempting Division 1.1 explosives or substances of Division 6.1, Packing Group I from any security provisions seems inappropriate.

2. Justification

- 2.0 The UK has modelled the effect of certain highly toxic gases to ascertain the effect they might have in the event of a deliberate release. The results for two such substances are shown below.

Hazard Ranges for Limited Quantities of Toxic Gases

For the purposes of this exercise, the quantity of material specified as the limit for each substance in a single container has been modelled as an instantaneous release, in two weather conditions, with a ground roughness length of 0.1m. The gases are assumed present at an ambient temperature of 15 degrees C.

The range to two harm levels are given. These correspond to a small percentage of fatality and 50% fatality respectively and are based on doses rather than concentrations. Others caught within the ranges would be expected to become casualties and require expert medical attention.

Results for the gases in the relevant quantities are given in the table below.

Substance	Weather	Range, metres	Range, metres
		Small %age of fatalities	50% fatalities
Phosgene, 20 kg	Daytime, neutral weather, wind speed 5m/s	52	30
	Nighttime, still, wind speed 2m/s	153	99
Chlorine, 50kg	Daytime, neutral weather, wind speed 5m/s	141	82
	Nighttime, still, wind speed 2m/s	196	108

- 2.1 To simplify, if 1000 people in the vicinity of a major northern European railway terminus (such as Victoria Station in London) were within 30 metres of a release of 20kg of phosgene in typical daytime conditions, 500 of them could be expected to die and many others would suffer severe injury.
- 2.2 A list of toxic gases currently exempted from the security provisions below the relevant threshold level, showing their LC₅₀ values, is given in Annex B attached.
- 2.3 It is the view of the UK that all the substances that have been exempted from the security provisions of Chapter 1.10 represent some security risk. All of them should be subject to the general provisions of 1.10.1 and 1.10.2. Recognising the possible difficulties for industry, in the short term, of meeting the more demanding provisions of 1.10.3, the UK agrees that certain substances in the high consequence dangerous goods list carried in quantities up to the maximum total quantity per transport unit specified in 1.1.3.6.3 should be exempted. But others, as suggested above, represent sufficient security concerns not to be so exempted. The proposal below thus seeks to modify the text of RID/ADR appropriately.
- 2.4 At some point in the future the Joint Meeting might also wish to consider whether it is appropriate for the substances identified in the proposal in paragraph 3 below to be allocated to Transport Category 0 rather than Transport Category 1 as at present.

3. Proposal

3.1 In ADR delete the text of 1.10.4 and insert a new indent in 1.1.3.6.2 as follows:

- Section 1.10.3 (except for explosives of Class 1, Divisions 1.1, 1.2, 1.3 Compatibility Group C, and 1.5, toxic gases of Class 2.3 with an LC₅₀ value of $\leq 400 \text{ ml/m}^3$ (Groups T, TF, TC, TO, TFC and TOC excluding aerosols) and toxic substances of Class 6.1 Packing Group I with an LC₅₀ value of $\leq 400 \text{ ml/m}^3$).

3.2 In RID amend 1.10.4 as follows:

Requirements in 1.10.3 do not apply when the quantities in each wagon or large container are not greater than those referred to in 1.1.3.6 except for explosives of Class 1, Divisions 1.1, 1.2, 1.3 Compatibility Group C, and 1.5, toxic gases of Class 2.3 with an LC₅₀ value of $\leq 400 \text{ ml/m}^3$ (Groups T, TF, TC, TO, TFC, and TOC excluding aerosols) and toxic substances of Class 6.1 Packing Group I with an LC₅₀ value of $\leq 400 \text{ ml/m}^3$.

ANNEX A

SECURITY OF DANGEROUS GOODS

As a consequence of the provisional adoption by RID/ADR/ADN of new security measures based on the UN Recommendations, the following significant differences have occurred because of the exemption of certain quantities. In accordance with the new 1.10.4 "Provisions in 1.10.1, 1.10.2 and 1.10.3 need not be applied when the quantities in each transport unit are smaller than those referred to in 1.1.3.6, 2.2.7.1.2 and in Chapters 3.3 and 3.4".

As part of this the following substances in the quantities indicated are now excluded from the provisions of 1.10.3 for high consequence dangerous goods which includes the requirement to implement and comply with a security plan: -

Class 1 Explosives in Divisions 1.1¹ (excluding Compatibility Groups A and L), 1.2 (excluding Compatibility Group L), 1.3 Compatibility Group C and 1.5¹ in quantities of 20 kg net mass or less.

¹ For UN numbers 0081, 0082, 0084, 0241, 0331, 0332 and 0482, the limit is 50 kg net mass.

Class 2.3 Toxic gases in groups T, TC², TO, TOC and TFC (but excluding aerosols of UN 1950 in these groups) in quantities of 20 kg/l or less.

Attached is a list of toxic gases in ascending order of toxicity related to their LC₅₀ value. However it is recognised that this is not the only factor determining the threat to life from the release of the gas.

² For UN 1005 and 1017, the limit is 50 kg.

Classes 3 (other than UN 3343) and 4.1, desensitized explosives in both classes in quantities of 20 kg net mass or less.

Class 6.1, Packing Group I (other than UN numbers 1051, 1613, 1614 and 3294) in quantities of 20 kg/l or less.

The following examples from the above list are taken to illustrate some worst case scenarios:

1) Class 1, Explosives, Division 1.1, Compatibility Groups B to G and J: -

20 kg NEQ,

except UN numbers 0081, 0082, 0084 and 0241 for which the NEQ is 50 kg.

2) Class 2.3, Toxic gases: -

20 l nominal capacity of receptacle for compressed gases, or
20 kg net mass for liquefied gases,

except 50 kg net mass for UN 1005 Ammonia anhydrous and UN 1017 Chlorine.

3) Class 6.1, Packing group I, toxic by inhalation liquids,

20 litres.

ANNEX B

TOXICITY OF GASES

Source: - RID/ADR 4.1.4.1, Packing Instruction P200, arranged in ascending order of toxicity.

+ This LC₅₀ value is under review

UN No.	Name and description	LC ₅₀ ml/m ³
2202	Hydrogen selenide, anhydrous	2
2190	Oxygen difluoride, compressed	2.6
1076	Phosgene	5
3057	Trifluoroacetyl chloride	10 +
2188	Arsine	20
2199	Phosphine	20
2676	Stibine	20
2195	Tellurium hexafluoride	25
1069	Nitrosyl chloride	35
2418	Sulphur tetrafluoride	40
2194	Selenium hexafluoride	50
2421	Nitrogen trioxide (prohibited)	57 +
1589	Cyanogen chloride, stabilized	80
1911	Diborane	80
1067	Dinitrogen tetroxide (Nitrogen dioxide)	115
1660	Nitric oxide, compressed	115
1975	Nitric oxide and dinitrogen tetroxide mixture (Nitric oxide and nitrogen dioxide mixture)	115
2548	Chlorine pentafluoride	122
2196	Tungsten hexafluoride	160 +
1045	Fluorine, compressed	185
2198	Phosphorus pentafluoride	190 +
2901	Bromine chloride	290
1017	Chlorine	293
1749	Chlorine trifluoride	299
2189	Dichlorosilane	314
1026	Cyanogen	350
2417	Carbonyl fluoride	360
1008	Boron trifluoride	387 +
1859	Silicon tetrafluoride	450
2420	Hexafluoroacetone	470
2534	Methylchlorosilane	600
2192	Germane	620 +
1053	Hydrogen sulphide	712
3083	Perchloryl fluoride	770
1062	Methyl bromide	850
1581	Chloropicrin and methyl bromide mixture	850
1582	Chloropicrin and methyl chloride mixture	+
1064	Methyl mercaptan	1350

2204	Carbonyl sulphide	1700
1082	Trifluorochloroethylene, stabilized	2000
1079	Sulphur dioxide	2520
1741	Boron trichloride	2541
1050	Hydrogen chloride, anhydrous	2810 +
1048	Hydrogen bromide, anhydrous	2860
2197	Hydrogen iodide, anhydrous	2860
1040	Ethylene oxide or ethylene oxide with nitrogen	2900 +
3300	Ethylene oxide and carbon dioxide mixture, > 87% ethylene oxide	> 2900
2191	Sulphuryl fluoride	3020
1016	Carbon monoxide, compressed	3760
1005	Ammonia, anhydrous	4000

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