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**Economic Commission for Europe****Inland Transport Committee****Working Party on the Transport of Dangerous Goods**

**Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)**

**Forty-third session**

Geneva, 22-26 January 2024

Item 5 (b) of the provisional agenda

**Proposals for amendments to the Regulations annexed to ADN:  
other proposals**

**Proposal for an amendment of the provisions related to sampling for substances with carcinogenic, mutagenic or toxic to reproduction (CMR) properties**

**Transmitted by the Government of Belgium\*.\*\***

**Introduction**

1. The Belgian delegation discovered during the examination on opening of openings that open sampling is possible for CMR substances according to column (5) of Table C of Chapter 3.2, and for which a type N vessel with closed cargo tanks (N2) is required.

2. The Belgian delegation is of the opinion that more stringent requirements are necessary to avoid opening of sampling openings of tank vessels loaded with cargoes, for which the danger "CMR" is indicated in column (5) of Table C of Chapter 3.2, due to:

- Environmentally issues.

Before opening the sampling openings of a closed tank, the overpressure of the cargo tank must be released through the depressurization devices. That means that a considerable amount of hydrocarbon vapors are released in the atmosphere.

- Health issues, exposure to high concentrations of CMR compounds.

As these vapors have CMR properties, in general with a low 'Accepted Exposure Level', not only persons involved in the sampling operation, but even other

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\* Distributed in German by the Central Commission for the Navigation of the Rhine under the symbol CCNR-ZKR/ADN/WP.15/AC.2/2024/16

\*\* A/78/6 (Sect. 20), table 20.5



persons on board or in the vicinity of the vessel may be exposed to high levels of toxic compounds.

- Safety issues.

When (closed) tanks containing flammable vapors in concentrations above the Lower Explosion Limit, a risk for electrical discharge due to static electricity may occur, although precautions are taken.

3. Herewith an example of the amount of product released in the atmosphere when opening sampling openings. As reference a cargo tank volume of 1.000 m<sup>3</sup> is considered, loaded with a gasoline-like product with a filling degree of 95 per cent. The vapor growth of the product is 1.25.

4. Assume after loading, an overpressure in the cargo tanks of 20 kPa. The volume of cargo vapours in the cargo tanks is 50 m<sup>3</sup>. The overpressure of 20 kPa is released through the depressurization devices into the atmosphere, means an amount of 50 m<sup>3</sup> × 0.2 kPa overpressure × 1.25 (the vapor growth) gives a volume released of 12.5 Nm<sup>3</sup>. The vapor phase consists of 50 per cent hydrocarbons and the balance 50 per cent air. Thus, 6.25 Nm<sup>3</sup> pure hydrocarbon vapours are released in the atmosphere per 1 000 m<sup>3</sup> cargo tank volume.

5. The vapor phase of the product mainly consists of the most volatile compounds of the product, being C4 / C5 - compounds and with a benzene content between 1.000 vppm to 10.000 vppm (!).

6. A volume of 6.25 Nm<sup>3</sup> with 100 per cent C4/C5 hydrocarbon vapours with a density of 2.5 kg/m<sup>3</sup> means a considerable quantity of 15.6 kg product released into the atmosphere per 1.000 m<sup>3</sup> total cargo tank volume.

7. Note that when a lesser filling degree of the cargo tanks is considered, this will result in a drastically increase of the vapor emission.

## Problem description

8. The actual requirements according to column (13) of Table C of Chapter 3.2 read as follows:

### Column (13): Determination of type of sampling device

1 = closed:

- Substances to be transported in pressure cargo tanks
- Substances with T in column (3b) and assigned to packing group I
- Stabilized substances to be transported under inert gas

2 = partly closed: – All other substances for which type C is required

3 = open: – All other substances

Thus, closed or partly closed sampling is only required for substances as mentioned above. CMR properties are not considered in the actual requirements.

9. The Belgian delegation has been brought to the attention that classification codes are commonly not used on board, nor in the transport document (see paragraph 5.4.1.1.2 (a) to (d)), nor in the ADN safety checklist (Chapter 8.6). Instead, dangers as indicated in column (5) of Table C of Chapter 3.2 are used. Classification codes of Column (3b) including a ‘T’ corresponds with ‘6.1’ in column (5) (or ‘2.3’ in case of Class 2). Therefore, the Belgian delegation suggests to replace “T in column (3b)” by “danger 6.1 in column (5)”.

10. The release of hydrocarbon vapours into the atmosphere must be avoided in view of environmental issues. Furthermore, if CMR compounds are involved, the release of such compounds is unacceptable in a view of safety. The concentration of hydrocarbons in the cargo tanks is usually above the lower explosion limit, especially in the case of packing group I and II substances. In addition, the opening of sampling openings may always include a potential risk for fire or explosion. The Belgian delegation is of the opinion that for

“Substances with danger CMR in column (5) and for which no closed sampling is required”, the open sampling device should be replaced at least by a partly closed sampling device.

## Proposal for amendment

11. The Belgian delegation proposes to amend column (13) of Table C of Chapter 3.2 as follows (new text in bold and underlined, deleted text in strikethrough):

Column (13): Determination of type of sampling device

- 1 = closed: – Substances to be transported in pressure cargo tanks
- Substances with ~~T in column (3b)~~ **[danger] 6.1 in column (5)** and assigned to packing group I
  - Stabilized substances to be transported under inert gas
- 2 = partly closed: – All other substances for which type C is required
- **Substances with [danger] CMR in column (5) and for which no closed sampling is required**
- 3 = open: – All other substances

12. The Belgian delegation proposes to amend section 3.3.4, under “E. Column (13): Determination of type of sampling device” as follows (new text in bold and underlined, deleted text in strikethrough):

- 1 = closed: – Substances to be transported in pressure cargo tanks
- Substances with ~~T in column (3b)~~ **[danger] 6.1 in column (5)** and assigned to packing group I
  - Stabilized substances to be transported under inert gas
- 2 = partly closed: – All other substances for which type C is required
- **Substances with [danger] CMR in column (5) and for which no closed sampling is required**
- 3 = open: – All other substances

*Note: Should a transitional provision be considered in view of the replacement of the sampling device?*

## Affected entries for amendment in Table C

13. The entries below in Table C are affected for which in Chapter 3.2, Table C,

- Column (5): danger “CMR”,
- Column (6): type of tank vessel “N”,
- Column (7): cargo tank type “2”, closed cargo tanks,

is indicated.

(a) Single entries:

UN Nos. 1171 / 1172 / 1188 / 1274 / 1276 / 1218 / 2675

(b) Generic entries, not N.O.S. entries: (\*)

UN Nos. 1202 (2 entries) / 1203 / (1223) / 1267 / 1863

(c) Specific N.O.S. entries and general N.O.S. entries: (\*)

UN Nos. 1224 / 1267 / 1268 / 1719 / 1760 / 1987 / 1989 / 1993 / 2735 / 2924 / 3272 / 3295 / 9001 / 9003 / 9005 / 9006

Remark: (\*) Entries for which the flow chart of 3.2.3.3 is applicable

14. The Table C with amendments is added in the annex of this working document.

## **Justification**

15. The Belgian delegation refers to the following Sustainable Development Goals:

- Goal 3: Good health and well-being

Not opening the sampling openings and not releasing the overpressure from the cargo tanks into the atmosphere will have a positive impact on the health and personal safety of people involved in this operation as well as to people on board and in the vicinity of the tank vessel.

- Goal 8: Decent work and economic growth

As no sampling equipment (sample can) need to be lowered in the cargo tanks, there will be no risk for dangerous static discharges. Herewith, a safer and more secure working environment will be achieved.

- Goal 13: Climate action

By keeping the sampling openings closed, there is no need to release the overpressure in the atmosphere. This gives a positive impact on the environment, thus less air pollution by Volatile Organic Compounds (VOC's) and / or aromatic compounds such benzene.

## **Action to be taken**

16. The Safety Committee is invited to consider the proposed amendments in paragraphs 11 and 12 above, and to take action as it deems appropriate.

17. The informal working group on Substances is invited to consider the remarks in the annex below, and to take action as it deems appropriate.

## Annex

Remarks:

In Table below:

- The **blue marked entries**. Depending on the outcome of ECE/TRANS/WP.15/AC.2/2024/18 - (FuelsEurope) - The reclassification of UN No. 1918, ISOPROPYLBENZENE (cumene) and substances containing cumene at or above 0.1 per cent
- For UN 3256 ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (Low QI Pitch): A Type 'N3' ship is not in line with the requirements following from box 2 of the flow chart of 3.2.3.3 (should be type 'N2' ship): see yellow marking.

Table C:

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the pressure relief valve/high in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks	
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	3.1.2	2.2	2.2	2.1.1.3	5.2.2 / 3.2.3.1	1.2.1 / 7.2.2.0.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	7.2.4.2.1	3.2.3.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	1.2.1	1.2.1 / 3.2.3.3	1.2.1 / 3.2.3.3	8.1.5	7.2.5	3.2.3.1
1171	ETHYLENE GLYCOL MONOETHYL ETHER	3	F1	III	3+CMR	N	2	3	3	10	97	0.93	☞ 2	yes	T3	II B (II B2)	yes	PP, EP, EX, TOX, A	0	
1172	ETHYLENE GLYCOL MONOETHYL ETHER ACETATE	3	F1	III	3+N3+CMR	N	2	3	3	10	97	0.98	☞ 2	yes	T2 <sup>12)</sup>	II A	yes	PP, EP, EX, TOX, A	0	
1188	ETHYLENE GLYCOL MONOMETHYL ETHER	3	F1	III	3+CMR	N	2	3	3	10	97	0.97	☞ 2	yes	T3	II B (II B2)	yes	PP, EP, EX, TOX, A	0	

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the pressure relief valve/high	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	3.1.2	2.2	2.2	2.1.1.3	5.2.2 / 3.2.3.1	1.2.1 / 7.2.2.0.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	7.2.4.2.1	3.2.3.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	1.2.1	1.2.1 / 3.2.3.3	1.2.1 / 3.2.3.3	8.1.5	7.2.5	3.2.3.1
1203	MOTOR SPIRIT or GASOLINE or PETROL	3	F1	II	3+N2+CMR+F	N	2	3	3	10	97	0,68 - 0,72 <sup>10)</sup>	3 2	yes	T3	II A	yes	PP, EP, EX, TOX, A	1	
1223	KEROSENE	3	F1	III	3+N2+F	N	3	3			97	≤ 0,83	3	yes	T3	II A <sup>7)</sup>	yes	PP, EX, A	0	14
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (NAPHTA) 110 kPa < vp50 ≤ 175 kPa	3	F1	II	3+N2+CMR+F	N	2	3		50	97	0,735	3 2	yes	T3	II A	yes	PP, EP, EX, TOX, A	1	14
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (NAPHTA) 110 kPa < vp50 ≤ 150 kPa	3	F1	II	3+N2+CMR+F	N	2	3	3	10	97	0,735	3 2	yes	T3	II A	yes	PP, EP, EX, TOX, A	1	14
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S. (NAPHTA) vp50 ≤ 110 kPa	3	F1	II	3+N2+CMR+F	N	2	3		10	97	0,735	3 2	yes	T3	II A	yes	PP, EP, EX, TOX, A	1	14
1268	PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S (BENZENE HEART CUT) vp50 ≤ 110 kPa	3	F1	II	3+N2+CMR+F	N	2	3		10	97	0,765	3 2	yes	T3	II A	yes	PP, EP, EX, TOX, A	1	14

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the pressure relief valve/high	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	3.1.2	2.2	2.2	2.1.1.3	5.2.2 / 3.2.3.1	1.2.1 / 7.2.2.0.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	7.2.4.2.1	3.2.3.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	1.2.1	1.2.1 / 3.2.3.3	1.2.1 / 3.2.3.3	8.1.5	7.2.5	3.2.3.1
1274	n-PROPANOL (propyl alcohol, normal)	3	F1	II	3	N	2	2		10	97	0.8	3 2	yes	T2 <sup>12)</sup>	II B (II B1)	yes	PP, EX, A	1	
1274	n-PROPANOL (propyl alcohol, normal)	3	F1	III	3	N	3	2			97	0.8	3 2	yes	T2 <sup>12)</sup>	II B (II B1)	yes	PP, EX, A	0	
1276	n-PROPYL ACETATE	3	F1	II	3+N3	N	2	2		10	97	0.88	3 2	yes	T1 <sup>12)</sup>	II A	yes	PP, EX, A	1	
1918	ISOPROPYLBENZENE (cumene)	3	F1	III	3+N2	N	3	3			97	0.86	3	yes	T2 <sup>12)</sup>	II A <sup>8)</sup>	yes	PP, EX, A	0	
2265	N,N-DIMETHYLFORMAMIDE	3	F1	III	3+CMR	N	2	3	3	10	97	0.95	3 2	yes	T2 <sup>12)</sup>	II A	yes	PP, EP, EX, TOX, A	0	
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BILGE WATER, CONTAINS SLUDGE)	9	M6	III	9+CMR+N1	N	2	3		10	97		3 2	yes			no	PP, EP TOX, A	0	45
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (OIL SLUDGE)	9	M6	III	9+CMR+N1	N	2	3		10	97		3 2	yes			No	PP, EP, TOX, A	0	45
3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE; LIQUID, N.O.S. (HEAVY HEATING OIL)	9	M6	III	9+CMR (N1, N2, F or S)	N	2	3		10	97		3 2	yes			no	PP	0	

UN No. or substance identification No.	Name and description	Class	Classification code	Packing group	Dangers	Type of tank vessel	Cargo tank design	Cargo tank type	Cargo tank equipment	Opening pressure of the pressure relief valve/high	Maximum degree of filling in %	Relative density at 20 °C	Type of sampling device	Pump room below deck permitted	Temperature class	Explosion group	Anti-explosion protection required	Equipment required	Number of cones/blue lights	Additional requirements/Remarks
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	3.1.2	2.2	2.2	2.1.1.3	5.2.2 / 3.2.3.1	1.2.1 / 7.2.2.0.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	7.2.4.21	3.2.3.1	3.2.3.1 / 1.2.1	3.2.3.1 / 1.2.1	1.2.1	1.2.1 / 3.2.3.3	1.2.1 / 3.2.3.3	8.1.5	7.2.5	3.2.3.1
3256	ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. with flash-point above 60 °C, at or above its flash-point (Low QI Pitch)	3	F2	III	3+N2+ CMR+S	N	3 ????	1	4		95	1,1-1,3	3 2	yes	T2 <sup>12)</sup>	II B (II B2)	yes	PP, EP, EX, TOX, A	0	7; 17
3295	HYDROCARBONS, LIQUID, N.O.S. (1-OCTEN)	3	F1	II	3+N2+F	N	2	3		10	97	0,71	3 2	yes	T3	II B <sup>4)</sup>	yes	PP, EX, A	1	14
3295	HYDROCARBONS, LIQUID, N.O.S. (POLYCYCLIC AROMATIC HYDROCARBONS MIXTURE)	3	F1	III	3+CMR+F	N	2	3	3	10	97	1,08	3 2	yes	T1 <sup>12)</sup>	II A	yes	PP, EP, EX, TOX, A	0	14
3475	ETHANOL AND GASOLINE MIXTURE or ETHANOL AND MOTOR SPIRIT MIXTURE or ETHANOL AND PETROL MIXTURE, with more than 10% but not more than 90% ethanol	3	F1	II	3+N2+ CMR+F	N	2	3	3	10	97	0.69 – 0.78 <sup>10)</sup>	3 2	yes	T3	II A	yes	PP, EP, EX, TOX, A	1	
3475	ETHANOL AND GASOLINE MIXTURE or ETHANOL AND MOTOR SPIRIT MIXTURE or ETHANOL AND PETROL MIXTURE, with more than 90% ethanol	3	F1	II	3+N2+ CMR+F	N	2	3	3	10	97	0.78 – 0.79 <sup>10)</sup>	3 2	yes	T2 <sup>12)</sup>	II B (II B1)	yes	PP, EP, EX, TOX, A	1	