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

Sub-Committee of Experts on the Transport of Dangerous Goods

Forty-sixth session
Geneva, 1 – 9 December 2014
Item 7 (b) of the provisional agenda
Recommendations made by the Sub-Committee on its forty-third, forty-fourth and forty-fifth sessions and pending issues: listing, classification and packing

Fuels in engines and machinery

Submitted by the expert from Belgium[1]

Introduction

1. During its forty-fourth session, the Sub-Committee discussed the issue of fuels in engines and machinery extensively (see ST/SG/AC.10/C.3/2013/67 (DGAC), informal documents INF.7 (DGAC), INF.59 (Belgium on behalf of the lunchtime working group) and decided the following as recorded in ST/SG/AC.10/C.3/88, para. 45:

(a) Prepare a proposal to introduce a new UN XXXX applicable to engines/machinery powered by flammable liquids/flammable gases/fuels cells. This new UN number should incorporate the provisions of SP 363;

(b) Develop a proposal to include appropriate hazard communication (e.g. flammability risk label, mention in transport document), linked to different quantity thresholds. The communication of "subsidiary risks" (e.g. when also lithium batteries are contained in the same machinery) should be the subject of a separate special provision, also depending on developments for hazard communication for lithium batteries

[1] In accordance with the programme of work of the Sub-Committee for 2013-2014 approved by the Committee at its sixth session (refer to ST/SG/AC.10/C.3/84, para. 86 and ST/SG/AC.10/40, para. 14).

(c) Draft the necessary consequential amendments to various parts of the Regulations (definition of vehicles, SP 363, SP 301, SP 312, SP 240, …). For this work, the working group highlighted the following items for consideration:

i. Identification of the types of fuels (with different thresholds, different UN numbers, ...);

ii. Distinguishing between vehicles (e.g. self-propelled) and machinery;

iii. Fuels which are only environmentally hazardous;

iv. Evaluation of the already developed modal provisions when drafting new text (e.g. IMDG SP 961 and SP 962, ICAO provisions for vehicles/machinery containing lithium batteries, …);

v. Ongoing work for classification and hazard communication in class 9.

2. During the forty-fifth session, the expert from Belgium and DGAC presented ST/SG/AC.10/C.3/2014/17, containing a comprehensive proposal and explanation to accomplish the revision of the Model Regulations with regards to fuels in engines and machinery, which was again discussed during a lunch time working group. On the basis of the comments received, Belgium and DGAC wish to thank all delegates who provided input and have consequently revised their proposal. The key changes with respect to the proposal contained in ST/SG/AC.10/C.3/2014/17 are:

(a) A note is additionally proposed for inclusion in 1.1.1.2, to distinguish more clearly between the general exemption for means of transport and the use of UN 3166, now limited to vehicles, when vehicles are carried as cargo.

(b) The packing provisions were moved from P907 (applicable to UN 3363) to a general P005 based on P907, to be able to use the packing instruction for multiple UN entries in different classes. Crates or handling devices were added to these packing provisions, based on existing text in 4.1.3.8.1 (e).

(c) Instead of a single UN entry, three UN entries are proposed. These cover machines and engines containing fuels of class 3, division 2.1 and class 9. In line with the general ongoing discussion on dangerous goods in articles (see for example document 2014/44) these UN entries are proposed within class 3, division 2.1 and class 9 respectively.

(d) Because of consequential changes to SP 312, an additional clarification is added to the end of the special provision that lithium batteries shall meet the requirements of 2.9.4 (current text), unless when otherwise specified or excepted from specific requirements in the Regulations (e.g. for low production runs or prototypes being transported for testing according to SP 310).

(e) The redrafted SP 363 is aligned textually with existing text adopted in the IMDG code SP 961 and 962 to the extent possible. Even though this was a comment received previously, the expert from Belgium and DGAC chose not to merge the new SP YYY, to be assigned to UN 3166, with the existing SP 240, assigned to UN 3171, even though both provisions clarify the meaning of “vehicles”. The two definitions were aligned, however. Due to a different editorial structure and because the examples of vehicles under SP YYY are of course different than the examples under SP 240, the two special provisions were kept separately but contain a cross reference to each other.

(f) The new SP 363 is modified to better structure the difference between the three new proposed UN numbers. The quantity thresholds have been reviewed following the discussions but kept between square brackets depending on the

outcome of the discussions. For liquid fuels, quantities below [60] liters are proposed to be exempt even from labelling. The different thresholds after that only serve to distinguish between two or more labels or placards and transport documentation. Here, the current thresholds (for large packagings and IBC's and for small tanks) of [450] and [3000] liters are proposed, along with the normal labelling provisions (meaning labelling or placarding on two opposite sides instead of all four sides – see 5.2.2.1.7 and 5.3.1.1.4). For gaseous fuels, in line with typical construction standards, [1000] liters is proposed instead of [3000] liters as threshold for placarding and transport documentation.

Proposal

3. In 1.1.1.2, insert a new NOTE 3 to read as follows:

   ***NOTE** 3: 1.1.1.2 a) above is only applicable to the means of transport performing the transport operation.*

4. Amend the proper shipping name of UN 3166 to read as follows:

   UN 3166 ~~ENGINE, INTERNAL COMBUSTION or~~ VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FLAMMABLE LIQUID POWERED or ~~ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED~~ or VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED

5. Amend SP 312 in chapter 3.3 to read as follows:

   Vehicles ~~or machinery~~ powered by a fuel cell engine shall be consigned under the entries UN 3166 VEHICLE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FUEL CELL, FLAMMABLE LIQUID POWERED, ~~or UN 3166 ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or UN 3166 ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED~~ as appropriate. These entries include hybrid electric vehicles powered by both a fuel cell and an internal combustion engine with wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the battery(ies) installed.

   Other vehicles which contain an internal combustion engine shall be consigned under the entries UN 3166 VEHICLE, FLAMMABLE GAS POWERED or UN 3166 VEHICLE, FLAMMABLE LIQUID POWERED, as appropriate. These entries include hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the batteries installed. Lithium batteries shall meet the requirements of 2.9.4,<u>except when otherwise specified by these Regulations.</u>

6. Delete the reference to SP 363 in column (6) of the dangerous goods list for UN 3475, 1863, 1268, 1223, 1203, 1202.

7. Add a new SP YYY to UN 3166 as follows:

   This entry applies to vehicles powered by flammable liquid or gas internal combustion engines or fuel cells.

   Hybrid electric vehicles powered by both an internal combustion engine and wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the batteries installed shall be consigned under this entry. Vehicles powered by wet batteries, sodium batteries, lithium metal batteries or lithium ion batteries, transported with the batteries installed, shall be consigned under the entry UN 3171 BATTERY-POWERED VEHICLE (see special provision 240).

For the purpose of this special provision, vehicles are self-propelled apparatus designed to carry one or more persons or goods. Examples of such vehicles are cars, motorcycles, trucks, locomotives, scooters, three- and four-wheeled vehicles or motorcycles, lawn tractors, self-propelled farming and construction equipment, boats and aircraft.

Dangerous goods such as batteries, air bags, fire extinguishers, compressed gas accumulators, safety devices and other integral components of the vehicle that are necessary for the operation of the vehicle or for the safety of its operator or passengers, must be securely installed in the vehicle and are not otherwise subject to these Model Regulations.

8. Amend SP 240 by deleting the words “Examples of such vehicles are electrically-powered cars, motorcycles, scooters, three- and four-wheeled vehicles or motorcycles, e bikes, wheel-chairs, lawn tractors, boats and aircraft.” and relacing them with “Examples of such vehicles are electrically-powered cars, motorcycles, trucks, locomotives, scooters, three- and four-wheeled vehicles or motorcycles, lawn tractors, self-propelled farming and construction equipment, boats and aircraft.”

9. Insert a new P005 in 4.1.4.1 to read as follows:

P005	**PACKING INSTRUCTION**	**P005**

This Packing Instruction applies to UN XXXX, UN YYYY and UN ZZZZ.

If **the** engine or machinery is constructed and designed so that the means of containment containing the dangerous goods affords adequate protection, an outer packaging is not required.

Dangerous goods in engines or machinery shall otherwise be packed in outer packagings constructed of suitable material, and of adequate strength and design in relation to the packaging capacity and its intended use, and meeting the applicable requirements of **4.1.1.1, or** they shall be fixed in cradles or crates or other handling devices in such a way that they will not become loose during normal conditions of transport.

In **addition**, the manner in which means of containment are contained within the engine or machinery, shall be such that under normal conditions of transport, damage to the means of containment containing the dangerous goods is unlikely; and in the event of damage to means of containment containing liquid dangerous goods, no leakage of the dangerous goods from the engine or machinery is possible (a leakproof liner may be used to satisfy this requirement).

Means of containment containing dangerous goods shall be so installed, secured or cushioned as to prevent their breakage or leakage and so as to control their movement within the engine or machinery during normal conditions of transport. Cushioning material shall not react dangerously with the content of the means of containment. Any leakage of the contents shall not substantially impair the protective properties of the cushioning material.

10. Insert three new UN numbers XXXX, YYYY and ZZZZ in the dangerous goods list to read as follows:

						Limited and excepted		*Packaging*		*Portable tanks and bulk containers*	
						quantities		*Packing instructions*	*Special packing provisions*	*Instructions*	*Special provisions*
UN No.	*Name and description*	*Class*	*Subsidiary risk*	*Packing group*	*Special provisions*						
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
XXXX	ENGINE, INTERNAL COMBUSTION or ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED or MACHINERY, INTERNAL COMBUSTION or MACHINERY, FUEL CELL, FLAMMABLE LIQUID POWERED	3			363	0	E0	P005			
YYYY	ENGINE, INTERNAL COMBUSTION or ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or MACHINERY, INTERNAL COMBUSTION or MACHINERY, FUEL CELL, FLAMMABLE GAS POWERED	2.1			363	0	E0	P005			
ZZZZ	ENGINE, INTERNAL COMBUSTION POWERED or MACHINERY, INTERNAL COMBUSTION	9			363	0	E0	P005			

11. Modify SP 363 to read as follows:

SP 363

(a) This entry applies to engines or machinery, powered by fuels classified as dangerous goods via internal combustion systems or fuel cells (e.g. combustion engines, generators, compressors, turbines, heating units, etc.), other than vehicles or those with small quantities of dangerous goods as a residue or an integral element of the machinery in which case they are subject to special provision 301.

(b) Engines or machinery which are empty of dangerous goods are not subject to these Model Regulations.

NOTE 1*: An engine or machinery is considered to be empty of liquid fuel when the the liquid fuel reservoir has been drained and the engine or machinery cannot be operated due to a lack of fuel. Engine or machinery components such as fuel lines, fuel filters and injectors do not need to be cleaned, drained or purged to be considered empty of liquid fuels. In addition, the liquid fuel reservoir does not need to be cleaned or purged.*

NOTE 2*: An engine or machinery is considered to be empty of gaseous fuels when the gaseous fuel reservoirs are empty of liquid (for liquefied gasses), the positive pressure in the reservoirs does not exceed 2 bar and the fuel shut-off or isolation valve is closed and secured.*

(c) Engines and machinery containing fuels meeting the classification criteria of Class 3, shall be consigned under the entries UN XXXX ENGINE, INTERNAL COMBUSTION or UN XXXX ENGINE, FUEL CELL, FLAMMABLE LIQUID POWERED or UN XXXX MACHINERY, INTERNAL COMBUSTION or UN XXXX MACHINERY, FUEL CELL, FLAMMABLE LIQUID POWERED, as appropriate.

(d) Engines and machinery containing fuels meeting the classification criteria of Division 2.1, shall be consigned under the entries UN YYYY ENGINE, INTERNAL COMBUSTION or UN YYYY ENGINE, FUEL CELL, FLAMMABLE GAS POWERED or UN YYYY MACHINERY, INTERNAL COMBUSTION or UN YYYY MACHINERY, FUEL CELL, FLAMMABLE GAS POWERED, as appropriate.

(e) Engines and machinery containing fuels meeting the classification criteria 2.9.3 for environmentally hazardous substances and not meeting the classification criteria of any other Class or Division, shall be consigned under the entries UN ZZZZ ENGINE, INTERNAL COMBUSTION or UN ZZZZ MACHINERY, INTERNAL COMBUSTION, as appropriate.

(f) Engines or machinery may contain other dangerous goods (e.g. batteries, fire extinguishers, compressed gas accumulators or safety devices) required for their functioning or safe operation without being subject to any other requirements of these Model Regulations if they are part of the original design type, unless otherwise specified in these Model Regulations.

(g) The engines or machinery are not subject to any other requirements of these Model Regulations if the following requirements are met:

i. The engine or machinery, including the means of containment containing dangerous goods, shall be in compliance with the construction requirements specified by the competent authority;

ii. Any valves or openings (e.g. venting devices) shall be closed during transport;

iii. The engines or machinery shall be oriented to prevent inadvertent leakage of dangerous goods and secured by means capable of restraining the engines or machinery to prevent any movement during transport which would change the orientation or cause them to be damaged;

iv. for UN XXXX and UN ZZZZ:

Where the engine or machinery contains more than [60] liters but not more than [450] liters of liquid fuel, the labelling requirements of 5.2.2 shall apply.

Where the engine or machinery contains more than [450] liters but not more than [3000] liters of liquid fuel, it shall be labelled on [two opposing sides] in accordance with 5.2.2.

Where the engine or machinery contains more than [3000] liters of liquid fuel, it shall be placarded on [two opposing sides] in accordance with 5.3.1.1.2;

For engines or machinery containing more than [60] liters of liquid fuels which are environmentally hazardous substances meeting the criteria of 2.9.3, an additional mark as specified in 5.2.1.6 and 5.3.2.3 shall be applied.

v. for UN YYYY:

Where the fuel reservoir of the engine or machinery has a capacity of not more than [450] liters, the labelling requirements of 5.2.2 shall apply.

Where the fuel reservoir of the engine or machinery has a capacity of more than [450] liters but not more than [1000] liters, it shall be labelled on [two opposing sides] in accordance with 5.2.2.

Where the fuel reservoir of the engine or machinery has a capacity of more than [1000] liters, it shall be placarded on [two opposing sides] in accordance with 5.3.1.1.2;

vi. A transport document in accordance with 5.4 is required where:

For UN XXXX and UN ZZZZ: the engine or machinery contains more than [450] liters of liquid fuels

For UN YYYY: the fuel reservoir of the engine or machinery has a capacity greater than [450] liters.