



DANGEROUS GOODS PANEL (DGP)

TWENTIETH MEETING

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 2007-2008 Edition

SUPPLEMENTARY INFORMATION FOR THE TABLE 7-1 - SEGREGATION BETWEEN PACKAGES AD-HOC WORKING GROUP

(Presented by J. Code)

1. INTRODUCTION

Attached is a series of documents for the consideration of the Working Group proposed in WP/61, Table 7-1 - Segregation between Packages.

SPECIAL CARGO SEGREGATION CHART



All Hazard Labels MUST be taken into account for Segregation

AIR NEW ZEALAND

SEGREGATE THESE CLASSES	↔	FROM THESE CLASSES - BY AT LEAST ONE METRE OR IN ACCORDANCE WITH ANY ADDITIONAL INSTRUCTIONS BELOW
<p>RCX, REX, RGX, RXB, RXC, RXD, RXE, RXS</p> <p>CLASS 1:- EXPLOSIVE</p>	↔	<p>EXCEPT 1.4S EXCEPT 1.4S</p>
<p>CLASS 2:- COMPRESSED GAS</p>	↔	<p>EXCEPT 1.4S</p> <div data-bbox="1149 380 1516 492" style="border: 1px solid black; padding: 5px;"> <p>NOTE ONLY EXPLOSIVES WITHIN DIVISION 1.4 COMPATIBILITY GROUP S (IE: 1.4S MAY BE CARRIED ON PASSENGER AIRCRAFT)</p> </div>
<p>CLASS 3:- FLAMMABLE LIQUID</p>	↔	<p>EXCEPT 1.4S</p>
<p>CLASS 4.1:- FLAMMABLE SOLID</p>	↔	<div data-bbox="1149 638 1516 750" style="border: 1px solid black; padding: 5px;"> <p>NOTE FLAMMABLE SOLID MUST BE STORED IN A WELL VENTILATED PLACE AWAY FROM HEAT AND DIRECT SUNLIGHT</p> </div>
<p>CLASS 4.2:- SPONTANEOUSLY COMBUSTIBLE</p>	↔	<p>EXCEPT 1.4S</p>
<p>CLASS 4.3:- DANGEROUS WHEN WET</p>	↔	<p>EXCEPT 1.4S</p>
<p>CLASS 5.1:- OXIDISER</p>	↔	<p>EXCEPT 1.4S</p>
<p>CLASS 5.2:- ORGANIC PEROXIDE</p>	↔	<p>EXCEPT 1.4S</p> <div data-bbox="1149 1153 1516 1265" style="border: 1px solid black; padding: 5px;"> <p>NOTE ORGANIC PEROXIDES MUST BE STORED IN A WELL VENTILATED PLACE AWAY FROM HEAT AND DIRECT SUNLIGHT</p> </div>
<p>CLASS 6:- TOXIC AND INFECTIOUS SUBSTANCES</p>	↔	<div data-bbox="702 1276 1069 1388" style="border: 1px solid black; padding: 5px;"> <p>NOTE MUST BE SEPARATED BY AT LEAST ONE METRE AND MUST NOT BE LOADED IN THE SAME COMPARTMENT UNLESS STOWED IN SEPARATE ENCLOSED ULD'S</p> </div> <div data-bbox="1149 1276 1516 1388" style="border: 1px solid black; padding: 5px;"> <p>NOTE CLASS 6 ITEMS ARE NOT PERMITTED IN THE FORWARD HOLD OF B767 AIRCRAFT</p> </div>
<p>CLASS 7:- RADIOACTIVE</p>	↔	<div data-bbox="853 1411 1220 1523" style="border: 1px solid black; padding: 5px;"> <p>NOTE SEGREGATE ON GROUND. MINIMUM SEPARATION DISTANCES APPLY - REFER TO IATA DGR, NZ DGM OR NZ CARGO PROCEDURES MANUAL</p> </div>
<p>CLASS 8:- CORROSIVE</p>	↔	<p>EXCEPT 1.4S</p>
<p>CLASS 9:- MISCELLANEOUS</p>	↔	<div data-bbox="638 1668 1005 1780" style="border: 1px solid black; padding: 5px;"> <p>NOTE MUST BE SEPARATED BY AT LEAST ONE METRE AND MUST NOT BE LOADED IN THE SAME COMPARTMENT UNLESS STOWED IN SEPARATE ENCLOSED ULD'S</p> </div> <div data-bbox="1149 1668 1516 1780" style="border: 1px solid black; padding: 5px;"> <p>NOTE FOR STOWAGE LIMITS FOR EACH AIRCRAFT TYPE, REFER TO THE NZ DGM OR NZ CARGO PROCEDURES MANUAL</p> </div>
<p>MAGNETISED MATERIAL</p>	↔	<div data-bbox="638 1792 1005 1904" style="border: 1px solid black; padding: 5px;"> <p>REAR HOLD ONLY</p> </div>
<p>FOODSTUFFS</p>	↔	<p>EXCEPT 1.4S</p> <div data-bbox="1149 1926 1516 2038" style="border: 1px solid black; padding: 5px;"> <p>NOTE MUST BE SEPARATED BY AT LEAST ONE METRE AND MUST NOT BE LOADED IN THE SAME COMPARTMENT UNLESS STOWED IN SEPARATE ENCLOSED ULD'S</p> </div>
<p>HUMAN REMAINS</p>	↔	

Part 7 – Provisions concerning transport operations

- 7.2.1.13 No segregation need be applied between dangerous goods of different classes which comprise the same substance but vary only in their water content, such as sodium sulphide in classes 4.2 and 8, or for class 7 if the difference is due to quantity only.
- 7.2.1.14 Where, for the purposes of segregation, terms such as "away from class ..." are used in the Dangerous Goods List, "class ..." is deemed to include:
- .1 all substances within "class ..."; and
 - .2 all substances for which a subsidiary risk label of "class ..." is required.
- 7.2.1.15 Stowage in a shelter-tween-deck cargo space is not considered to be *on deck* stowage.
- 7.2.1.16 **Segregation table**

The following table shows the general provisions for segregation between the various classes of dangerous goods.

SINCE THE PROPERTIES OF SUBSTANCES, MATERIALS OR ARTICLES WITHIN EACH CLASS MAY VARY GREATLY, THE DANGEROUS GOODS LIST SHALL ALWAYS BE CONSULTED FOR PARTICULAR PROVISIONS FOR SEGREGATION AS, IN THE CASE OF CONFLICTING PROVISIONS, THESE TAKE PRECEDENCE OVER THE GENERAL PROVISIONS.

SEGREGATION SHALL ALSO TAKE ACCOUNT OF A SINGLE SUBSIDIARY RISK LABEL.

CLASS	1.1 1.2 1.5	1.3 1.6	1.4	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
Explosives 1.1, 1.2, 1.5	*	*	*	4	2	2	4	4	4	4	4	4	2	4	2	4	X
Explosives 1.3, 1.6	*	*	*	4	2	2	4	3	3	4	4	4	2	4	2	2	X
Explosives 1.4	*	*	*	2	1	1	2	2	2	2	2	2	X	4	2	2	X
Flammable gases 2.1	4	4	2	X	X	X	2	1	2	X	2	2	X	4	2	1	X
Non-toxic, non-flammable gases 2.2	2	2	1	X	X	X	1	X	1	X	X	1	X	2	1	X	X
Toxic gases 2.3	2	2	1	X	X	X	2	X	2	X	X	2	X	2	1	X	X
Flammable liquids 3	4	4	2	2	1	2	X	X	2	1	2	2	X	3	2	X	X
Flammable solids (including self-reactive substances and solid desensitized explosives) 4.1	4	3	2	1	X	X	X	X	1	X	1	2	X	3	2	1	X
Substances liable to spontaneous combustion 4.2	4	3	2	2	1	2	2	1	X	1	2	2	1	3	2	1	X
Substances which, in contact with water, emit flammable gases 4.3	4	4	2	X	X	X	1	X	1	X	2	2	X	2	2	1	X
Oxidizing substances (agents) 5.1	4	4	2	2	X	X	2	1	2	2	X	2	1	3	1	2	X
Organic peroxides 5.2	4	4	2	2	1	2	2	2	2	2	2	X	1	3	2	2	X
Toxic substances 6.1	2	2	X	X	X	X	X	X	1	X	1	1	X	1	X	X	X
Infectious substances 6.2	4	4	4	4	2	2	3	3	3	2	3	3	1	X	3	3	X
Radioactive material 7	2	2	2	2	1	1	2	2	2	2	1	2	X	3	X	2	X
Corrosive substances 8	4	2	2	1	X	X	X	1	1	1	2	2	X	3	2	X	X
Miscellaneous dangerous substances and articles 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Numbers and symbols relate to the following terms as defined in this chapter:

- 1 – "Away from"
- 2 – "Separated from"
- 3 – "Separated by a complete compartment or hold from"
- 4 – "Separated longitudinally by an intervening complete compartment or hold from"
- X – The segregation, if any, is shown in the Dangerous Goods List
- * – See 7.2.7.2 of this chapter

- 7.2.1.17 For the purposes of the segregation provisions for the various means of transport by sea, this chapter has been subdivided as follows:
- .1 segregation of packages: 7.2.2;
 - .2 segregation of cargo transport units on board container ships: 7.2.3;
 - .3 segregation of cargo transport units on board roll-on/roll-off ships: 7.2.4;
 - .4 segregation in shipborne barges and on board barge-carrying ships: 7.2.5;
 - .5 segregation between bulk materials possessing chemical hazards and dangerous goods in packaged form: 7.2.6.

Part 7 - Provisions concerning transport operations

7.2.2.3 Segregation in cargo transport units

Dangerous goods which have to be segregated from each other shall not be transported in the same cargo transport unit with the exception of dangerous goods which shall be segregated "away from" each other which may be transported in the same cargo transport unit with the approval of the competent authority. In such cases an equivalent standard of safety shall be maintained.

7.2.2.4 Segregation of dangerous goods stowed in the conventional way from those transported in cargo transport units

7.2.2.4.1 Dangerous goods stowed in the conventional way shall be segregated from goods transported in open cargo transport units in accordance with 7.2.2.2.

7.2.2.4.2 Dangerous goods stowed in the conventional way shall be segregated from goods transported in closed cargo transport units in accordance with 7.2.2.2 except that:

- .1 where "away from" is required, no segregation between the packages and the closed cargo transport units is required; and
- .2 where "separated from" is required, the segregation between the packages and the closed cargo transport units may be as for "away from" as defined in 7.2.2.2.1.1.

7.2.3 Segregation of cargo transport units on board container ships

7.2.3.1 Applicability and definitions

7.2.3.1.1 The provisions of this subsection apply to the segregation of cargo transport units which are transported on board full container ships or on decks, or in holds and compartments of other types of ships provided that these cargo spaces are properly fitted to give a permanent stowage of the containers during transport (see 7.2.3.2). For the open holds of hatchless container ships, see table 7.2.3.3.

7.2.3.1.2 *Container space* means a distance of not less than 6 m fore and aft or not less than 2.4 m athwartships.

7.2.3.1.3 For ships which incorporate conventional cargo spaces or any other method of stowage, the appropriate subsection of this chapter shall apply to the relevant cargo space.

7.2.3.2 Table of segregation of freight containers on board container ships

SEGREGATION REQUIREMENT	VERTICAL			HORIZONTAL						
	CLOSED VERSUS CLOSED	CLOSED VERSUS OPEN	OPEN VERSUS OPEN	CLOSED VERSUS CLOSED		CLOSED VERSUS OPEN		OPEN VERSUS OPEN		
				ON DECK	UNDER DECK	ON DECK	UNDER DECK	ON DECK	UNDER DECK	
"AWAY FROM" .1	ONE ON TOP OF THE OTHER PERMITTED	OPEN ON TOP OF CLOSED PERMITTED	NOT IN THE SAME VERTICAL LINE UNLESS SEGREGATED BY A DECK	FORE AND AFT	NO RESTRICTION	NO RESTRICTION	NO RESTRICTION	NO RESTRICTION	ONE CONTAINER SPACE	ONE CONTAINER SPACE OR ONE BULKHEAD
		OTHERWISE AS FOR "OPEN VERSUS OPEN"		ATHWART-SHIPS	NO RESTRICTION	NO RESTRICTION	NO RESTRICTION	NO RESTRICTION	ONE CONTAINER SPACE	ONE CONTAINER SPACE
"SEPARATED FROM" .2	NOT IN THE SAME VERTICAL LINE UNLESS SEGREGATED BY A DECK	AS FOR "OPEN VERSUS OPEN"	NOT IN THE SAME VERTICAL LINE UNLESS SEGREGATED BY A DECK	FORE AND AFT	ONE CONTAINER SPACE	ONE CONTAINER SPACE OR ONE BULKHEAD	ONE CONTAINER SPACE	ONE CONTAINER SPACE OR ONE BULKHEAD	ONE CONTAINER SPACE	ONE BULKHEAD
				ATHWART-SHIPS	ONE CONTAINER SPACE	ONE CONTAINER SPACE	ONE CONTAINER SPACE	TWO CONTAINER SPACES	TWO CONTAINER SPACES	ONE BULKHEAD
"SEPARATED BY A COMPLETE COMPARTMENT OR HOLD FROM" .3	NOT IN THE SAME VERTICAL LINE UNLESS SEGREGATED BY A DECK	AS FOR "OPEN VERSUS OPEN"	NOT IN THE SAME VERTICAL LINE UNLESS SEGREGATED BY A DECK	FORE AND AFT	ONE CONTAINER SPACE	ONE BULKHEAD	ONE CONTAINER SPACE	ONE BULKHEAD	TWO CONTAINER SPACES	TWO BULKHEADS
				ATHWART-SHIPS	TWO CONTAINER SPACES	ONE BULKHEAD	TWO CONTAINER SPACES	ONE BULKHEAD	THREE CONTAINER SPACES	TWO BULKHEADS
"SEPARATED LONGITUDINALLY BY AN INTERVENING COMPLETE COMPARTMENT OR HOLD FROM" .4	PROHIBITED	PROHIBITED	NOT IN THE SAME VERTICAL LINE UNLESS SEGREGATED BY A DECK	FORE AND AFT	MINIMUM HORIZONTAL DISTANCE OF 24 METRES	ONE BULKHEAD AND MINIMUM HORIZONTAL DISTANCE OF 24 METRES*	MINIMUM HORIZONTAL DISTANCE OF 24 METRES	TWO BULKHEADS	MINIMUM HORIZONTAL DISTANCE OF 24 METRES	TWO BULKHEADS
				ATHWART-SHIPS	PROHIBITED	PROHIBITED	PROHIBITED	PROHIBITED	PROHIBITED	PROHIBITED

* CONTAINERS NOT LESS THAN 6 METRES FROM INTERVENING BULKHEAD.

NOTE: ALL BULKHEADS AND DECKS SHALL BE RESISTANT TO FIRE AND LIQUID.

7.2.2 Segregation of packages

7.2.2.1 Applicability

7.2.2.1.1 The provisions of this subsection apply to the segregation of:

- .1 packages containing dangerous goods and stowed in the conventional way;
- .2 dangerous goods within cargo transport units; and
- .3 dangerous goods stowed in the conventional way from those packed in such cargo transport units.

7.2.2.2 Segregation of packages containing dangerous goods and stowed in the conventional way

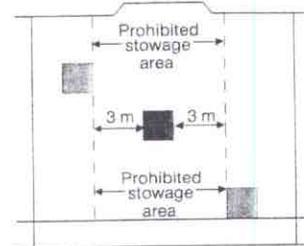
7.2.2.2.1 Definitions of the segregation terms

Legend

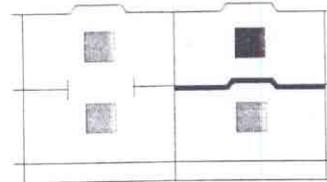
- (1) Reference package 
- (2) Package containing incompatible goods 
- (3) Deck resistant to fire and liquid 

NOTE: Full vertical lines represent transverse bulkheads between cargo spaces (compartments or holds) resistant to fire and liquid.

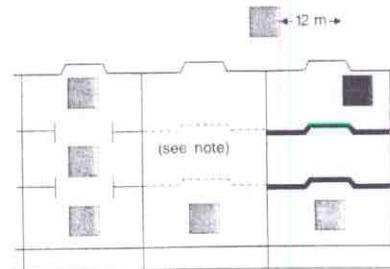
- .1 *Away from:*
Effectively segregated so that the incompatible goods cannot interact dangerously in the event of an accident but may be transported in the same compartment or hold or *on deck*, provided a minimum horizontal separation of **3 metres, projected vertically**, is obtained.



- .2 *Separated from:*
In different compartments or holds when stowed *under deck*. Provided the intervening deck is resistant to fire and liquid, a vertical separation, i.e. in different compartments, may be accepted as equivalent to this segregation. For *on deck* stowage, this segregation means a separation by a distance of **at least 6 metres horizontally**.



- .3 *Separated by a complete compartment or hold from:*
Either a vertical or a horizontal separation. If the intervening decks are not resistant to fire and liquid, then only a longitudinal separation, i.e. by an intervening complete compartment or hold, is acceptable. For *on deck* stowage, this segregation means a separation by a distance of **at least 12 metres horizontally**. The same distance has to be applied if one package is stowed *on deck* and the other one in an upper compartment.



Note: One of the two decks must be resistant to fire and to liquid.

- .4 *Separated longitudinally by an intervening complete compartment or hold from:*
Vertical separation alone does not meet this requirement. Between a package *under deck* and one *on deck*, a minimum distance of 24 metres, including a complete compartment, must be maintained longitudinally. For *on deck* stowage, this segregation means a separation by a distance of **at least 24 metres longitudinally**.

