

## **Mar-ICE Protocol activation**

**EXERCISE – EXERCISE – EXERCISE**

**Container ship – *OCEAN TRAVELLER***

**EXERCISE – EXERCISE – EXERCISE**

## **Dangerous containers risk assessment – Report No1–**



<p style="text-align: center;"><i>Cedre</i> 715, rue Alain Colas, CS 41836 29218 BREST CEDEX 2 - FRANCE</p>	<p>Phone: 33 (0)2 98 33 10 10 Fax: 33 (0)2 98 44 91 38 E-mail: <a href="mailto:contact@cedre.fr">contact@cedre.fr</a> Internet: <a href="http://www.cedre.fr">http://www.cedre.fr</a></p>	
<p><b>Contract reference:</b> Mar-Ice protocol (contract 5161)</p>		
<p style="text-align: center;"><b>MAR-ICE PROTOCOL ACTIVATION</b></p> <p style="text-align: center;"><b>CONTAINER SHIP – OCEAN TRAVELLER</b></p> <p style="text-align: center;"><b>DANGEROUS CONTAINERS RISK ASSESSMENT</b> <b>Report No1</b></p>		
<p><b>Drafted by:</b></p>	<p><b>Reread by:</b></p>	<p><b>Checked by:</b></p>
<p><b>Key words:</b> Wreckage, OCEAN TRAVELLER. risk assessment, containers, priorities</p>		
<p><b>Number of pages:</b> ?? Not including inside cover / summary / annexes <b>Number of pages in the annexes:</b> 0</p>	<p><b>Distribution:</b> <b>CONFIDENTIAL</b> <b>Electronic copies to :</b> EMSA, CEFIC, MS</p>	
<p><b>Name of electronic file / saved on:</b> RXX.XX/XXXX _CEDRE_RiskAssessment_1xxxx.doc <b>File:</b> N:\xxx <b>Registered:</b></p>		
<p><b>Filed / internal copies:</b> Intervention / Documentation</p>		

## **Context**

On 22nd of November 2013 around 05:40 UTC in the position 52° North and 002°.45 East the fully laden Dutch flag tanker mv. “BULK LOADER” collided with the 7380 TEU Panamanian flag container vessel “OCEAN TRAVELLER”.

The tanker was bound for Rotterdam from the anchorage off the coast of Lowestoft, whereas the container vessel came from Edinburgh also bound for Rotterdam. The cause of the collision is under investigation.

Conditions at sea were good, with south-westerly winds Beaufort 4 to 5; poor visibility. Both vessels according to AIS information maintained a considerable speed.

With regard to the container vessel first reports indicated heavy damage to the bow with effects to first cargo holds. Fire broke out in cargo hold 2 and about 20 containers were reported lost overboard.

Name: OCEAN TRAVELLER  
 Ship type: container ship  
 Call sign: xxxx  
 IMO: xxxx  
 MMSI nr: xxxx  
 Date built: xxxx  
 TEU: 7380  
 Flag: Panamanian  
 Date: 22 November 2013  
 Location: Southern, North Sea  
 Cause of incident: unknown  
 Length: xxxx  
 Draught: xxxx

## **Aims of the study**

Netherlands obtained the list of dangerous packaged goods that the container vessel transported from the SafeSeaNet- see below. Netherlands requested assistance from the MAR-ICE network to evaluate:

- what are the most hazardous substances that should be taken into account when evaluating the impact of spill into the environment ;
- evaluation both in terms of marine environmental impact and risks for intervening personnel.

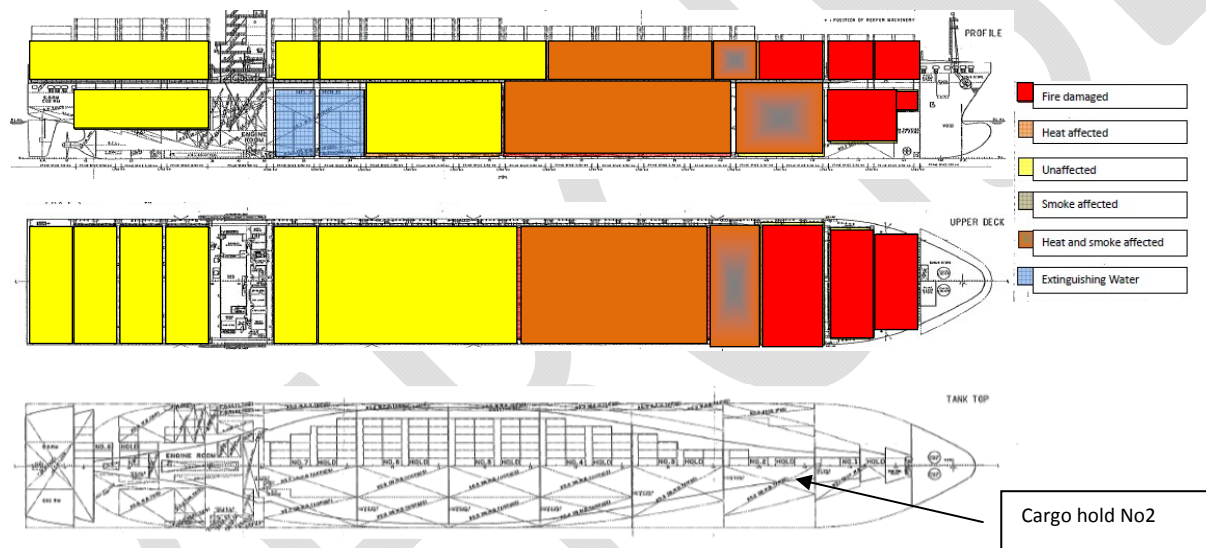
Dutch Authorities officially posed this request to MAR-ICE.

**SELECTION CRITERIA****of priority substances / containers to consider regarding risks for human beings and for the environment**

On board, 41 containers have been considered as containing dangerous goods. Considering the overview of affected areas located on the following general arrangement plan of the *OCEAN TRAVELLER*, we have considered containers which were:

- unaffected (yellow);
- heat and/or smoke affected (orange/grey);
- extinguishing water affected (blue).

The containers located in the fire damaged area (red part) were not considered in the present study.



The tables available hereafter, list the substances representing risks for the human beings (responders) and environment, regarding the IMDG (danger classes 3, 4, 6, 8 and 9).

The bunkers of the ship (heavy fuel oil, volume remaining on board unknown) that may present a serious hazard for the environment in case of rupture of the ship; have not been considered.

Regarding the 20 containers that were lost overboard no information was available, therefore these have not been considered in this report.

**Legend used:**

UN Class	Dangerous Goods	Division(s)	Classification
2	Gases	2,1	Flammable gas
		2,2	Non-flammable, non-toxic gas
		2,3	Toxic gas
3	Flammable liquid		Flammable liquid
4	Flammable solids	4,1	Flammable solid
		4,2	Spontaneously combustible substance
		4,3	Substance which in contact with water emits flammable gas
6	Toxic substances	6,1	Toxic substance
8	Corrosive substances		Corrosive substance
9	Miscellaneous dangerous goods		Miscellaneous dangerous goods
	Dangerous for the environment / Marine pollutant		

**The priority scale is the following:**

<b>Very serious :</b>	<ul style="list-style-type: none"> <li>- Chemicals that react with air or/and water (as sodium even in small amount) ;</li> <li>- Chemicals that present a serious threat for the environment (heavy metals compounds, PCBs).</li> </ul> <p><i>A special care must be taken when handling.</i></p>
<b>Serious :</b>	<ul style="list-style-type: none"> <li>- Toxic and flammable chemicals ;</li> <li>- Chemicals noted as hazardous for the environment in the Dangerous Goods Declaration ;</li> </ul> <p><i>Care must be taken in order to avoid inhalation and any contact with skin and lungs.</i></p> <p><i>Need to be handled away from hot spots and flames.</i></p>
<b>Moderate :</b>	<ul style="list-style-type: none"> <li>- Although these chemical are noted as dangerous, the hazards are moderate when handling (engines, perfumes, etc.) either for responders or for the environment.</li> </ul> <p><i>Avoid any water outflow in the environment.</i></p>
<b>Minor</b>	<ul style="list-style-type: none"> <li>- The chemicals in this category are not considered as a priority compared with the sus mentioned ones.</li> </ul>

## **GENERAL RISK ASSESSMENT**

Hereafter are listed the containers considered, in each section of the vessel, as very serious, serious, moderate, and minor on the risk point of view. All the comments justifying such a classification for each container (one by one) are detailed in the tables on the following pages.

The total weight of the containers considered, in the frame of our study, represents around **797 T** of dangerous goods.

### **Fire damaged part**

Many of the containers located in the front part of *OCEAN TRAVELLER* contain toxic chemicals. The residues and the water contained in the holds after the fire are highly toxic for man and environment.

Care must be taken in order to avoid any contact and any residual mixture dumping in coastal waters and above all in an unloading harbour.

### **Unaffected sections – fore part (representing around: 33 T)**

Minor: 2, flammable (33 T)

### **Unaffected sections - Aft part (representing around: 419 T)**

Very serious: 1 product highly toxic and flammable (stowing position xxxxx / weight : 4.6 T)

Serious: 16 representing 344 T within

- 4 flammable products (60 T)

- 5 toxic products (102 T)

- 4 corrosive products (106 T)

- 3 environmental hazardous products (75 T).

Moderate: 3 (39 T)

Minor: 2 (32 T)

### **Heat and/or smoke affected (representing around: 310 T)**

Very serious: 5 representing 99.2 T, within

- 3 marine pollutant (stowing position : xxx, xxx, xxx / representing 70 T)

- 1 flammable, liable to ignite spontaneously in air (stowing position: xxx / representing 22 T)

- 1 flammable, floats on water Reacts violently with moisture, water and acids, evolving hydrogen (stowing position: xxx / representing 7 T).

Serious: 10 representing 210T within

- 4 flammable (98 T)

- 1 Toxic (8,6 T)

- 2 corrosive (37 T)

- 3 environmental hazardous (67 T)

### **Extinguishing water affected (representing around: 355 T)**

Serious: 2 environmental hazardous (355 T)

## **CONCLUSION**

The most dangerous chemicals on board (noted as very serious in our table, located in the heat and smoke affected areas) regarding effect to man and environment are located in:

- Bay 17 on deck (water and air reactive products, 2 containers);
- Bay 38 under deck (PCBs, 2 containers);
- And Bay 43 under deck (lead compounds, 1 container).

The other dangerous chemicals (noted as serious, 28 containers) are mainly located in the aft part of the ship (16 containers), mainly toxic products (5 containers) and flammable (4 containers).

Extinguishing water and residues present in the central holds should show a high level of toxicity for the environment especially in shallow waters.



**Unaffected areas fore part**

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
10	40	17.80	Full	1139	(1) ALUMINIUM PLATES, SHEETS AND STRIP, OF A THICKNESS (2) HAZ PAINT	COATING SOLUTION (includes surface treatments or coatings used for industrial purposes	2	3	Generic			MINOR
10	40	15.30	Full	3166	(1) PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEA (40 PKGS)	ENGINE, INTERNAL COMBUSTION or VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FLAMMABLE LIQU		9				MINOR

**Unaffected areas aft part**

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
5	20	4.60	MT	3384		TOXIC BY INHALATION LIQUID, FLAMMABLE, N.O.S. with an inhalation toxicity lower than or	1	61	Flammable	Highly toxic if swallowed, by skin contact and inhalation		VERY SERIOUS
9	20	23.70	Full	3302	(1) OXYGEN- FUNCTION AMINOCOMPOUNDS- - OTHER	2- DIMETHYLAMINOETHYL ACRYLATE	2	61	Colourless liquid	Toxic if swallowed, by skin contact and inhalation Causes tears	Miscible with water	SERIOUS



Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
9	20	25.30	Full	2735	(1) OXYGEN-FUNCTION AMINOCOMPOUNDS- - OTHER	AMINES, LIQUID, CORROSIVE, N.O.S. or POLYAMINES, LIQUID, CORROSIVE, N.O.S.	2	8	Colourless liquid with a pugnent odour <b>In case of fire : toxic gas release</b> Corrosif to most metals Reacts violently with acids	Causes burns to skin, eyes and mucous membranes		SERIOUS
9	20	24.90	Full	2261	(1) MINERAL OR CHEMICAL FERTILISERS, NITROGENOUS- UR	XYLENOLS, SOLID	2	61	Solid	<b>Toxic</b> if swallowed, by skin contact and inhalation		SERIOUS
9	20	25.30	Full	2381	(1) ORGANO-SULPHUR COMPOUNDSX. ORGANO- INORGANIC COMP	DIMETHYL DISULPHIDE	2	3	Yellow liquid With unpleasant odour <b>In case of fire : toxic gas release</b>	Harmful by inhalation	Immiscible with water	SERIOUS
9	20	22.20	Full	2411	(1) HAZARDOUS CHEMICALS	BUTYRONITRILE	2	61	Colourless liquid Flamable	<b>Toxic</b> if swallowed, by skin contact and inhalation	Immiscible with water	SERIOUS
9	20	25.30	Full	3455	(1) CRESOLS AND THEIR SALTS	CRESOLS, SOLID	2	61	Light yellow solid <b>Melting point : 30°C</b>	<b>Toxic</b> if swallowed, by skin contact and inhalation Causes burns to skin, eyes and mucous membranes	Miscible with water	SERIOUS

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
9	20	6.10	MT	1738		BENZYL CHLORIDE	2	61	Colourless liquid with a pungent odour <b>Corrosive</b> to most metals, in presence of moisture	<b>Toxic</b> if swallowed, by skin contact and inhalation Causes tears Causes burns to skin, eyes and mucous membranes		<b>SERIOUS</b>
10	40	18.90	Full	1139	(1) HAZ PAINT (20 PKGS)	COATING SOLUTION (includes surface treatments or coatings used for industrial purposes s)	2	3	Generic			<b>MINOR</b>
10	40	12.60	Full	3166	(1) PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEA (2) PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEA (3) PARTS AND ACCESSORIES OF THE MOTOR VEHICLES OF HEA	ENGINE, INTERNAL COMBUSTION or VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FLAMMABLE LIQUID		9				<b>MINOR</b>
11	20	25.10	Full	3082	(1) UN3082 HAZ CHEMS	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3	9				<b>SERIOUS</b>
11	20	3.90	Full	1993	(1) REACTION INITIATORS, REACTION ACCELERATORS AND CAT (11 PKGS)	FLAMMABLE LIQUID, N.O.S.	2	3	Flash Point : -21°C			<b>SERIOUS</b>
11	20	25.10	Full	3082	(1) UN3082 HAZ CHEMS	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3	9				<b>SERIOUS</b>

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
11	20	25.10	Full	3082	(1) UN3082 HAZ CHEMS	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3	9				SERIOUS
11	20	11.80	Full	1993	(1) REFRIGERATORS, FREEZERS AND OTHER REFRIGERATING OR (2) NON HAZ (3) REFRIGERATORS, FREEZERS AND OTHER REFRIGERATING OR (4) NON HAZ	FLAMMABLE LIQUID, N.O.S.	2	3	Contains Methanol and Ethanol			SERIOUS
11	20	18.80	Full	1120	(1) ORGANIC SURFACE-ACTIVE AGENTS (OTHER THAN SOAP); S (2) HAZ CHEMICALS (3) HAZ CHEMICALS	BUTANOLS	3	3	Colourless liquid Flash Point : 11°C	Highly flammable Desagreeable odour Irritating to eyes, skin and mucous membranes	Immiscible with water	SERIOUS
65	20	26.70	Full	3267	(1) CARBONATES; PEROXOCARBONATES (PERCARBONATES); COMM	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	3	8	Reacts violently with acids	Causes burns to skin, eyes and mucous membranes		SERIOUS
65	20	27.00	Full	3267	(1) CARBONATES; PEROXOCARBONATES (PERCARBONATES); COMM	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	3	8	Reacts violently with acids	Causes burns to skin, eyes and mucous membranes		SERIOUS
65	20	8.10	Full	3166	(1) UN3166, VEHICLE (2 PKGS)	ENGINE, INTERNAL COMBUSTION or VEHICLE, FLAMMABLE GAS POWERED or VEHICLE, FLAMMABLE LIQUID		9		May contain small quantities of flammable products (liquid or gas)		MODERATE

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
66	40	16.50	Full	1266	(1) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS FO (2) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS FO (3) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS FO (4) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS	PERFUMERY PRODUCTS with flammable liquid	2	3		Flammable liquid	Miscibility with water depends upon the composition	MODERATE
66	40	14.30	Full	1266	(1) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS FO (2) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS FO (3) BEAUTY OR MAKE-UP PREPARATIONS AND PREPARATIONS FO (4) BEAUTY OR MAKE-UP PREPARATIONS NON HAZ	PERFUMERY PRODUCTS with flammable liquid	2	3		Flammable liquid	Miscibility with water depends upon the composition	MODERATE
67	20	27.70	Full	3267	(1) CARBONATES; PEROXOCARBONATES (PERCARBONATES); COMM	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	3	8	Reacts violently with acids	Causes burns to skin, eyes and mucous membranes		SERIOUS

## Heat and smoke affected areas

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
17	20	21.70	Full	3394	(1) HAZ CHEMICALS	ORGANOMETALLIC SUBSTANCE, LIQUID, PYROPHORIC, WATER- REACTIVE	1	42	Liquid Reacts violently with moisture, water and acids, evolving flammable gas	Highly flammable Liable to ignite spontaneously in air, evolve irritating and slightly toxic fumes		<u>VERY SERIOUS</u>
17	20	18.50	Full	3267	(1) ORGANIC SURFACE-ACTIVE AGENTS (OTHER THAN SOAP); S (16 PKGS)	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	2	8	Organic liquid Basic React violently with acid	Causes burns to skin, eyes and mucous membranes		SERIOUS
17	20	18.30	Full	3267	(1) ORGANIC SURFACE-ACTIVE AGENTS (OTHER THAN SOAP); S (16 PKGS)	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S.	2	8	Organic liquid Reacts violently with acid	Causes burns to skin, eyes and mucous membranes		SERIOUS
17	20	6.60	MT	1428		SODIUM	1	43	Floats on water Reacts violently with moisture, water and acids, evolving hydrogen. Highly reactive with explosive effect			<u>VERY SERIOUS</u>
38	40	26.00	Full	2315	(1) POLES AND WOODEN BARS (2) PCB S CONTAMINATED SOLIDS (3) PCB S CONTAMINATED	POLYCHLORINATED BIPHENYLS, LIQUID		9	Liquid and solid products Immiscible with water Persistent		Marine pollutant	<u>VERY SERIOUS</u>

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
					LIQUIDS				risk for environment			
38	40	25.90	Full	2315	(1) PCB S CONTAMINATED LIQUIDS (2) PCB S CONTAMINATED SOLIDS (3) POLES AND WOODEN BARS	POLYCHLORINATED BIPHENYLS, LIQUID		9	Liquid and solid products Immiscible with water Persistent risk for environment		Marine pollutant	<u>VERY SERIOUS</u>
43	20	26.80	Full	3077	(1) MANGANESE SULFATE (24 PKGS)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	3	9				SERIOUS
43	20	17.40	Full	3082	(1) ALKOXYLATED POLYIMINE (76 PKGS)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3	9				SERIOUS
43	20	19.00	Full	2291	(1) LEAD SULFOCHROMATE YELLOW (2) LEAD SULFOCHROMATE YELLOW	LEAD COMPOUND, SOLUBLE, N.O.S.	3	61	Miscible with water Contains heavy metals	Toxic if swallowed, by skin contact and inhalation	Marine Pollutant	<u>VERY SERIOUS</u>
45	20	8.60	Full	2810	(1) TRIETHYLENEGLYCO L DIMERCAPTANE (8 PKGS)	TOXIC LIQUID, ORGANIC, N.O.S.	3	61		Toxic if swallowed, by skin contact and inhalation		SERIOUS
45	20	22.60	Full	3077	(1) ZINC OXIDE (215 PKGS)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	3	9				SERIOUS
45	20	25.00	Full	1148	(1) VINYL TOLUENES, STA BILIZED,	DIACETONE ALCOHOL	2	3	Colourless liquid Miscible with water			SERIOUS

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
47	20	24.40	Full	1993	(1) MINERAL OR CHEMICAL FERTILISERS, NITROGENOUS- UR	FLAMMABLE LIQUID, N.O.S.	3	3				SERIOUS
47	20	24.50	Full	1993	(1) MINERAL OR CHEMICAL FERTILISERS, NITROGENOUS- UR	FLAMMABLE LIQUID, N.O.S.	3	3				SERIOUS
47	20	24.50	Full	1993	(1) MINERAL OR CHEMICAL FERTILISERS, NITROGENOUS- UR	FLAMMABLE LIQUID, N.O.S.	3	3				SERIOUS

### Extinguishing water affected containers

Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
50	40	18.70	Full	3082	(1) PREPARED RUBBER ACCELERATORS; COMPOUND PLASTICISER (2) PREPARED RUBBER ACCELERATORS; COMPOUND PLASTICISER (3) POLYCARBOXYLIC ACIDS, THEIR ANHYDRIDES, HALIDES, P	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	3	9	liquid			SERIOUS



Bay	Size	Weight (tonne)	Loaded	UN No	Cargo manifest	PROPER SHIPPING NAME	Pak Group	Class	Behaviour	Danger for human beings	Danger for environment	Priority
50	40	16.80	Full	3077	(1) SYNTHETIC ORGANIC COLOURING MATTER, WHETHER OR NOT (2) SYNTHETIC ORGANIC COLOURING MATTER, WHETHER OR NOT (3) SYNTHETIC ORGANIC COLOURING MATTER, WHETHER OR NOT (4) SYNTHETIC ORGANIC COLOURING MATTER, WHETHER OR NOT (5) INSECTICIDES, RODENTICIDES, FUNGICIDES, HERBICIDES	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	3	9	liquid and solid products			SERIOUS