

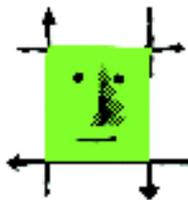
From The Titanic to The Costa Concordia



The *Titanic* - From the painting by Willy Stöwer.
April 1912



The *Costa Concordia* © Photo Robin des Bois.
April 2012



ROBIN DES BOIS

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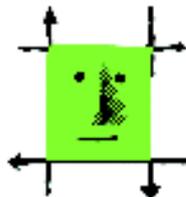
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I-The passenger ship has become a cruise destination

The traditional passenger ship used to travel from one point to another in a straight line. In off-peak periods, some were assigned to pleasure cruises in tourist regions (the Canary Islands, Aegean Sea, the Norwegian Fjords, the Caribbean, for example), but these services were only accessible to a well-off elite who had the time and means to take such trips.

Competition from airlines led some ship-owners to change tack into the cruise business, either by converting their ships or placing orders for specifically designed units. Cruises became more accessible, but without becoming a mass leisure activity.

Things were to change in 1966. The 'modern' cruise appeared with the entry into service of the *Sunward*, from Norwegian Caribbean Lines and owned by Ted Arison, linked to the Norwegian Knut Kloster, operating between Miami and the Caribbean Islands. Customers discovered a new type of cruise: a modern ship with a single class, reasonable prices, and a relaxed atmosphere that contrasted with the traditionally stilted image of the cruise.

By launching the Carnival Cruise Line in 1972, Ted Arison developed the concept of the "*fun ship*" where it was the boat itself – with its numerous on-board attractions – that was the true destination, rather than the scheduled stopovers. As he said: "*Carnival operates in the vacation industry, and not the cruise industry*". Competition did not come from other companies, but it was rather Las Vegas and Orlando where a closer look was taken for changes and potentially for new ideas. A Carnival cruise-ship was described as "a complete floating holiday centre where passengers can entertain themselves almost 24 hours a day". This blueprint, shared by several other companies, would lead to the development of mass-cruising.

To keep prices attractive to the middle class, all the while maintaining profit margins, ship-owners, in competition with one another, built larger and larger cruise-liners over the years, and spread expenses (crew, propulsion) across a larger number of passengers. In 1999, *Voyager of the Seas* was the largest cruise ship in the world, carrying 3,100 passengers. By 2009, this award went to *Oasis of the Seas* with a capacity of 5,400.

The growth in ship size does not only have an economic purpose. The larger ships are, the more "*amenities*" can be offered, such diverse and varied attractions as: swimming pools, spas, gyms, beauty salons, shopping centres, children's areas, theatres, nightclubs, casinos, mini-golf or even climbing walls or jogging tracks... to seduce passengers – or "*guests*" as they are now known – as much as or even more than the ports of call on the itinerary.

This razzle-dazzle is the norm on American ships; however, this superficiality does not merit the title of luxury ship; rather, search a smaller vessel for such pleasures. We also saw an evolution towards larger, more sophisticated and comfortable cabins with sea-facing balconies...

Interest in the stopovers - the duration of which is shortened - becomes somewhat secondary. Ship operators offer more and more one week cruises, or even packages for several days only, to both attract customers on a tight budget (the shorter, the cheaper) or those lacking the spare time. Moreover, the size of these vessels only allows them access to a limited number of ports, where there are a number of reduced stopovers for each rotation.

Intense advertising campaigns in the United States have led to cruises being seen as a holiday among others. The television series "The Love Boat", which aired from 1977 to 1987, and in which one of the stars was the Pacific Princess cruise ship, played a major role across the Atlantic in promoting cruises. Besides, she just left Genoa to be scrapped in Turkey.

For customers, the large cruise ship assures them a change of scenery, an escape from everyday life and a guaranteed party on a real floating city, where you can do the things that are normally forbidden. People go on cruises to have a good time with family or friends. Even if this is often an embarrassment for some, the large cruise ship also gives them the opportunity to let their hair down *en masse*.

In 2010, the number of people taking cruises worldwide rose to 18.7 million; 10.5 million of these were North American and 5.5 million European. In relation to 2006, we note that whilst the number of

cruise passengers has stagnated in North America, we have seen an increase of 57% in Europe (estimated figures from Royal Caribbean Cruise, Ltd.).

II - Cruise ships with more than 2,500 passengers

Since it is necessary to fix a limit over which a cruise ship may be considered "large capacity", we have set this limit at 2,500 passengers. That being said, there are 97 ships currently in service with a capacity to carry over 2,500 passengers. Passenger capacity can be counted in different ways. On the one hand, we have "double occupancy" (i.e., the number of cabins multiplied by two), which is the standard formula for the profession and, on the other hand, we have the maximum capacity that supposes that all passenger beds are occupied. Thus, *Oasis of the Seas* and *Allure of the Seas*, owned by Royal Caribbean International, are currently the largest cruise ships in the world, holding up to a maximum of 6,360 passengers, whilst their capacity in "double occupation" terms is 5,400. Let us not forget that there are also between 1,000 and 1,300 crew members on board, depending on the company and vessel size. In the case of *Oasis* and *Allure of the Seas*, the number of crew members totals 2,100, which means you can count up to 8,460 people on board in total.

These 97 cruise ships only fly six flags. The colours of the Bahamas and Panama are well ahead of the rest with 35 and 26 vessels respectively. Then come the flags of Italy (16), Bermuda (14), Malta (5) and the Netherlands (1).

For the next summer season, nearly half of the large cruise liners will be based in the United States (45 out of 97). Another large contingent (33 units) will be found in the Mediterranean, while Northern Europe, including the Baltic Sea and Norwegian fjords, will play host to 16 ships. Only two of this size of ship are positioned in Asia, *Voyager of the Seas*, part of Royal Caribbean International, and *Superstar Virgo*, from the Malaysian Star Cruises Group. Cunard's *Queen Mary 2* is a special case insofar as its core (but not exclusive) business is the Southampton/New York return crossing.

Larger capacity vessels are clearly preferred by ship-owners; of the 16 cruise ships in construction or on order after the May commissioning period, 13 of them hold more than 2,500 passengers. For the moment, no order exceeds the current record capacity of 5,400 passengers (in double occupancy), or even comes close.

Group Carnival Corporation (USA)

CARNIVAL CRUISE LINES (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Carnival Breeze	Panama	2012	Fincantieri	306	3690	4600	Mediterranean
Carnival Conquest	Panama	2002	Fincantieri	290	2974	3783	Miami/Caribbean
Carnival Destiny	Bahamas	1996	Fincantieri	272	2642	3360	Miami/Caribbean
Carnival Dream	Panama	2009	Fincantieri	305	3646	3652	Port Canaveral/Mexico, Caribbean
Carnival Ecstasy	Panama	1991	Kvaerner	262	2056	2634	Port Canaveral/Bahamas
Carnival Elation	Panama	1998	Kvaerner	262	2052	2634	New Orleans/Mexico
Carnival Fantasy	Panama	1990	Masa-Yards	260	2056	2624	Charleston/Bahamas
Carnival Fascination	Bahamas	1994	Kvaerner	262	2052	2594	Jacksonville/Bahamas
Carnival Freedom	Panama	2007	Fincantieri	290	2974	3783	Fort Lauderdale/Caribbean
Carnival Glory	Panama	2003	Fincantieri	290	2974	3783	Boston or New York/Canada
Carnival Imagination	Bahamas	1995	Kvaerner	262	2052	2634	Miami/Mexico
Carnival Inspiration	Bahamas	1996	Kvaerner	262	2052	2634	Los Angeles/Mexico
Carnival Legend	Panama	2002	Kvaerner	293	2124	2667	Tampa/Mexico
Carnival Liberty	Panama	2005	Fincantieri	290	2978	3700	Miami/Caribbean
Carnival Magic	Panama	2011	Fincantieri	305	3690	4600	Galveston/MexicoCaribbean
Carnival Miracle	Panama	2004	Kvaerner	293	2124	2680	New York/Caribbean
Carnival Paradise	Panama	1998	Kvaerner	262	2052	2594	Tampa/Mexico
Carnival Pride	Panama	2001	Kvaerner	293	2124	2680	Baltimore/Bahamas
Carnival Sensation	Bahamas	1993	Kvaerner	262	2052	2634	Port Canaveral/Bahamas
Carnival Spirit	Panama	2001	Kvaerner	293	2124	2680	Seattle/Alaska
Carnival Splendor	Panama	2008	Fincantieri	290	3006	3540	Los Angeles/Mexico
Carnival Triumph	Bahamas	1999	Fincantieri	273	2758	3360	Galveston/Mexico
Carnival Valor	Panama	2004	Fincantieri	290	2974	3783	Miami/Caribbean
Carnival Victory	Panama	2000	Fincantieri	273	2758	3360	Puerto Rico/Caribbean

HOLLAND AMERICA LINE (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Nieuw Amsterdam	Netherlands	2010	Fincantieri	285	2106	2671	Venice/Mediterranean

COSTA CROCIERE (Italy)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Costa Atlantica	Italy	2000	Kvaerner	293	2114	2680	Mediterranean
Costa Deliziosa	Italy	2010	Fincantieri	294	2260	2828	Amsterdam/Norway, Mediterranean/Canary Islands
Costa Fascinosa	Italy	2012	Fincantieri	290	3016	3800	Venice/Mediterranean
Costa Favolosa	Italy	2011	Fincantieri	290	3016	3800	Venice/Mediterranean
Costa Fortuna	Italy	2003	Fincantieri	272	2716	3470	Norway, Baltic
Costa Luminosa	Italy	2009	Fincantieri	294	2260	2826	Copenhagen/Baltic, Norway, then Mediterranean
Costa Magica	Italy	2004	Fincantieri	272	2716	3470	Nice-Savone/Mediterranean
Costa Mediterranea	Italy	2003	Kvaerner	293	2114	2680	Mediterranean, Black Sea
Costa Pacifica	Italy	2009	Fincantieri	290	3008	3780	Norway, Baltic
Costa Serena	Italy	2007	Fincantieri	290	3000	3780	Marseille/Mediterranean
<i>Costa X</i>	Italy	<i>2014</i>	<i>Fincantieri</i>	-	<i>3700</i>	<i>4900</i>	<i>In construction</i>

CUNARD LINE (United Kingdom)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Queen Mary 2	Bermuda	2003	St. Nazaire	345	2620	3090	Southampton/New York, Norway

P&O CRUISES (United Kingdom)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Arcadia	Bermuda	2005	Fincantieri	285	2016	2556	Southampton/Mediterranean, Norway, Baltic
Azura	Bermuda	2010	Fincantieri	290	3100	3597	Southampton/Mediterranean, Spain, Scandinavia
Ventura	Bermuda	2008	Fincantieri	290	3078	3597	Southampton/Mediterranean, Spain, Scandinavia
<i>X</i>	-	<i>2015</i>	<i>Fincantieri</i>		<i>3600</i>	<i>4372</i>	<i>In construction</i>

PRINCESS CRUISES (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Caribbean Princess	Bermuda	2004	Fincantieri	290	3080	3796	Southampton/Northern Europe, New York/Canada
Coral Princess	Bermuda	2002	St. Nazaire	294	1970	2581	Vancouver/Alaska
Crown Princess	Bermuda	2006	Fincantieri	289	3080	3599	Venice/Mediterranean/Civitavecchia
Diamond Princess	Bermuda	2004	Mitsubishi	290	2670	3290	Vancouver/Alaska
Emerald Princess	Bermuda	2007	Fincantieri	289	3080	3599	Copenhagen/Baltic

Golden Princess	Bermuda	2001	Fincantieri	290	2590	3100	Seattle/Alaska
Grand Princess	Bermuda	1998	Fincantieri	290	2590	3100	Southampton/Mediterranean, Scandinavia
Ruby Princess	Bermuda	2008	Fincantieri	289	3080	3599	Barcelona/Mediterranean/Venice
Sapphire Princess	Bermuda	2004	Mitsubishi	290	2670	3290	Vancouver/Alaska
Star Princess	Bermuda	2002	Fincantieri	290	2590	3300	Seattle/Alaska
Royal Princess	-	2013	Fincantieri	-	3600	-	In construction
X	-	2014	Fincantieri	-	3600	-	In construction

AIDA CRUISES (Germany)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Aidabella	Italy	2008	Meyer	252	2050	2500	Majorque/Mediterranean
Aidablu	Italy	2010	Meyer	253	2192	2800	Warnemünde/Baltic
Aidadiva	Italy	2007	Meyer	252	2050	2500	Antalya (Turkey)/Mediterranean
Aidaluna	Italy	2009	Meyer	252	2050	2500	Hamburg/Norway, New York/Bermuda, Bahamas
Aidamar	Italy	2012	Meyer	253	2192	2800	Hamburg/Norway and Iceland ; Hamburg/Le Havre
Aidasol	Italy	2011	Meyer	253	2192	2800	Warnemünde/Baltic
<i>Aidastella</i>	-	2013	<i>Meyer</i>	253	2192	2800	<i>In construction</i>
X	-	2015	<i>Mitsubishi</i>	-	3250	-	<i>In construction</i>
Y	-	2016	<i>Mitsubishi</i>	-	3250	-	<i>In construction</i>

Group Royal Caribbean Cruises Ltd (USA)

ROYAL CARIBBEAN INTERNATIONAL (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Adventure of the Seas	Bahamas	2001	Kvaerner	311	3100	3807	Malaga/Mediterranean, Canary Islands
Allure of the Seas	Bahamas	2010	STX Finland	360	5400	6360	Fort Lauderdale/Caribbean
Brilliance of the Seas	Bahamas	2002	Meyer	292	2100	2502	Amsterdam and Le Havre/Norway
Enchantment of the Seas	Bahamas	1997	Kvaerner	301	2250	2730	Baltimore/Bermuda
Explorer of the Seas	Bahamas	2000	Kvaerner	311	3100	3840	Bermuda, Caribbean
Freedom of the Seas	Bahamas	2006	Aker	339	3600	4375	Port Canaveral/Caribbean
Independence of the Seas	Bahamas	2008	Aker	339	3600	4375	Southampton/Canary Islands, Mediterranean
Jewel of the Seas	Bahamas	2004	Meyer	293	2100	2502	Harwich/Baltique
Liberty of the Seas	Bahamas	2007	Aker	339	3600	4375	Barcelona et Toulon/Mediterranean
Majesty of the Seas	Bahamas	1992	St. Nazaire	268	2350	2767	Miami/Bahamas

Mariner of the Seas	Bahamas	2003	Kvaerner	311	3100	3807	Civitavecchia/Mediterranean
Monarch of the Seas	Bahamas	1991	St. Nazaire	268	2350	2766	Port Canaveral/Bahamas
Navigator of the Seas	Bahamas	2002	Kvaerner	311	3100	3807	Civitavecchia/Mediterranean
Oasis of the Seas	Bahamas	2009	STX Finland	360	5400	6360	Fort Lauderdale/Caribbean
Radiance of the Seas	Bahamas	2001	Meyer	293	2100	2531	Vancouver/Alaska
Serenade of the Seas	Bahamas	2003	Meyer	293	2100	2490	Barcelona/Mediterranean
Voyager of the Seas	Bahamas	1999	Kvaerner	311	3100	3840	Asia (notably China)
X	-	2014	Meyer	-	4100	-	In construction
Y	-	2015	Meyer	-	4100	-	In construction

CELEBRITY CRUISES (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Celebrity Solstice	Malta	2008	Meyer	317	2850	3145	Barcelona/Mediterranean
Celebrity Equinox	Malta	2009	Meyer	317	2850	3145	Civitavecchia/Mediterranean
Celebrity Eclipse	Malta	2010	Meyer	317	2850	3145	Southampton/Norway, Baltic, Mediterranean
Celebrity Silhouette	Malta	2011	Meyer	315	2886	3184	Venice and Civitavecchia/Mediterranean
<i>Celebrity Reflection</i>	-	2012	Meyer	315	3030	3270	In construction

PULLMANTUR CRUISES (Spain)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Sovereign	Malta	1987	St. Nazaire	268	2300	2600	Barcelona/Mediterranean

Other Companies

DISNEY CRUISE LINE (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Disney Magic	Bahamas	1998	Fincantieri	294	1750	2700	Port Canaveral and New York/Bahamas, New York/Canada
Disney Wonder	Bahamas	1999	Fincantieri	294	1750	2700	Seattle/Alaska
Disney Dream	Bahamas	2010	Meyer	340	2500	4000	Port Canaveral/Bahamas
Disney Fantasy	Bahamas	2012	Meyer	340	2500	4000	Port Canaveral/Caribbean

NORWEGIAN CRUISE LINE (USA)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Norwegian Dawn	Bahamas	2002	Meyer	294	2340	2683	Boston/Bermuda, Boston/Québec
Norwegian Epic	Bahamas	2010	St.Nazaire	329	4100	5186	Barcelona-Marseille/Mediterranean
Norwegian Gem	Bahamas	2007	Meyer	294	2394	2750	New York/Bahamas, New York/Québec
Norwegian Jade	Bahamas	2006	Meyer	294	2402	2750	Venice/Mediterranean
Norwegian Jewel	Bahamas	2005	Meyer	294	2402	2750	Seattle/Alaska
Norwegian Pearl	Bahamas	2007	Meyer	294	2394	2750	Seattle/Alaska
Norwegian Spirit	Bahamas	1998	Meyer	268	2018	2975	Barcelona/Venice and vice versa
Norwegian Star	Bahamas	2001	Meyer	294	2348	2683	New York/Bermuda
<i>Norwegian Breakaway</i>	-	2013	<i>Meyer</i>	-	4000	5100	<i>In construction</i>
<i>Norwegian Gateway</i>	-	2014	<i>Meyer</i>	-	4000	5100	<i>In construction</i>

STAR CRUISES (Malaysia)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
Superstar Virgo	Panama	1999	Meyer	269	1870	2975	Singapore/Malaysia and Thailand

MSC CRUISES (Italy)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
MSC Divina	Panama	2012	St. Nazaire	333	3502	4363	Venice/Mediterranean
MSC Fantasia	Panama	2008	St. Nazaire	333	3274	3882	Marseille/Mediterranean
MSC Magnifica	Panama	2010	St. Nazaire	294	2550	3013	Baltic, Norway
MSC Musica	Panama	2006	St. Nazaire	294	2550	3013	Venice/Mediterranean
MSC Orchestra	Panama	2007	St. Nazaire	294	2550	3013	Livourne/Mediterranean
MSC Poesia	Panama	2008	St. Nazaire	294	2550	3013	Baltic, Norway
MSC Splendida	Panama	2009	St. Nazaire	333	3274	3882	Genoa/Mediterranean
<i>MSC Preziosa</i>	-	2013	<i>St. Nazaire</i>	-	3500	-	<i>In construction</i>

TUI CRUISES (Germany)

Ship	Flag	Year of Build	Builders	Length (meters)	Capacity (Double Occupancy)	Maximum Capacity (Approx.)	Route Assignment (Summer 2012)
X	-	2014	STX Finland	295	2500	-	<i>In construction</i>

III - Disaster first, regulation later

On 14th April 1912, during its maiden voyage to New York, the *Titanic*, after considerable reflection claimed to be unsinkable, struck an iceberg and sank that night, leading to the loss of 1,503 passengers and crew. At that time, when maritime transport was essentially mobilised by anonymous migrants, routine accidents caused between 700 and 800 deaths a year on vessels flying the British flag alone. The sinking of the *Titanic*, a celebrity vessel steeped in lyricism, made governments act. In January 1914, 13 countries (including France) met in London at the invitation of the British government and adopted the first SOLAS Convention for the Safety of Life at Sea. But, the First World War broke out and the first version of SOLAS did not enter into force, even though several countries did integrate some of its provisions into their national legislation.

In 1929, a second conference convened in London, attended by 18 countries. A new version of the SOLAS Convention was adopted, and came into force in 1933. It included regulation on the watertight subdivision of ships and specified that lifeboats and floating devices "shall be readily available in case of emergency and shall be adequate". "It must be possible to embark the passengers rapidly and in good order".

In 1948, rapid technical developments in the radio communications field and also successive disasters like the *Morro Castle* (a fire, which killed 137 in 1934), called for a third version of SOLAS. This new text notably went into detail about the stability and maintenance of essential ship functions in case of an emergency. The Inter-Governmental Maritime Consultative Organisation (IMCO), which later became the IMO, was created under the auspices of the United Nations the same year and became the permanent body responsible for overseeing maritime transport.

The IMO organised its first SOLAS conference twelve years later, **in 1960**, in which 55 countries took part. A fourth version of the Convention was adopted. New requirements for radio equipment and life-saving appliances were specifically imposed.

In 1974, the internal rules of the IMO and the growing number of Member States slowed down the entry into force of new SOLAS requirements. Regulatory innovations were all well and good, but proved expensive when the time came for application. However, in 1974 a new Convention with faster deadlines for implementation and amendments was adopted by 71 countries. This version of SOLAS remains in force today and is regularly amended following disasters, market evolutions and ship deficiencies.

Thus, repeated accidents caused by fires on board passenger ships, such as *SS Yarmouth Castle* (1965, 90 deaths), brought about amendments being made in the area of fire prevention (thermal compartmentalisation, restricted use of combustible materials, detection devices and fire fighting measures...). It was during this time that the use of asbestos on ships was encouraged.

In 1983, the chapter dedicated to life-saving appliances and arrangements was revised with a view to reinforce their readiness, the safe abandonment of the ship, survival, detection and retrieval of survivors.

In 1988, the capsizing of *The Herald of Free Enterprise* (1987, 193 deaths) led to specific amendments regarding ships transporting passengers and vehicles -ro-ro/passenger ships better known as car ferries-; it also accelerated the adoption of provisions aimed at further improving the stability of all passenger ships following problems.

In April 1992, following the fire aboard the *Scandinavian Star* (158 deaths in 1990), fire prevention and fighting devices were reinforced; in particular, passenger ships had to be fitted with smoke detection, alarm and sprinkler systems in accommodation and service areas, stairways and corridors. Emergency lighting systems also had to be installed. The introduction of these new measures occurred gradually, up until 2000. All existing passenger ships were concerned, whereas in the past, new SOLAS rules generally only applied to new vessels.

In 1994, SOLAS integrated a new chapter to make the International Safety Management (ISM) Code mandatory, requiring intervention procedures to deal with emergency situations on board, and the on-shore implementation of an emergency support unit co-responsible for crisis management.

In 1996, provisions relative to fire safety measures for passenger ships were once more modified. Since their revision in 1992, the fires on board the *Achille Lauro* (1994, 2 killed and 8 wounded) and the *Regent Star* (1995, 2 injured) served as wake-up calls.

The International Life-Saving Appliances Code (LSA) was created. The technical characteristics for life-saving devices, buoys, life jackets, immersion suits, distress flares and smoke signals were combined. For example, all life rafts must be constructed to withstand exposure for 30 days afloat whatever the sea conditions, its interior must be a colour that does not disturb the occupants and it must be equipped with a set of fishing gear. All lifeboats must be strong enough to be launched when the ship in distress is making headway at a speed of 5 knots in calm waters. This provision was introduced to take into account the inability of larger and larger ships to stop quickly. The LSA limited lifeboat capacity to 150 people.

In 1997, after the *Estonia* ferry disaster (1994, 852 dead), passenger ships carrying 400 persons or more had to comply with the requirements initially only imposed on ferries to avoid capsizes even in the event of flooding of the main compartments.

In 2000, the International Code for Fire Safety Systems (FSS Code) was adopted. Concern was expressed towards the IMO about the gigantism and the excessiveness of cruise ships, and about the increasing frequency of damage, incidents, fire outbreaks and other anomalies discovered. The IMO launched a review of safety measures applying to this type of ship.

In 2004, emergency training and exercises, maintenance and the inspection of lifesaving equipment were reviewed.

In 2005, measures to ensure the stability of passenger vessels were changed once again.

In 2006, work started in 2000 on passenger ship safety resulted in a new series of amendments devoted to the "safe return to port" of vessels. The cruise ship was itself considered the best lifeboat and even if there is a fire or flooding onboard, the ship must remain operational for a safe return to port. The myth of the unsinkable ship resurfaced. As with the *Titanic*, the myth once again went down with the *Costa Concordia*.

In a case of a fire, if the ship cannot reach land, the essential systems for fire fighting and evacuation must remain available for 3 hours, the time to allow for an orderly evacuation. These provisions apply to passenger ships built since 1st July 2010 and which are over 120m long.

Seafarers' unions believe the ship's captain does not have enough freedom and information on the technical situation so that he can make a conscientious decision on whether to evacuate or remain on board despite the problem. This is an enormous responsibility. Other experts also point out that the strategy of returning to port has diverted attention away from the main issue, namely, the difficulty of evacuating thousands of passengers and crew members.

The 2006 amendments clarify, yet further, the number of lifejackets for toddlers and the obligation to provide devices for attaching jackets on people weighing up to 140kg. The evacuation of panicking, overweight people along corridors is a concern, as is the evacuation of elderly, disabled persons or children.

Following the *Star Princess* accident (see chapter on fires), fire prevention provisions were once more amended to make the installation of fire detection and alarm systems on cabin balconies a requirement.

In 2007, the *Sea Diamond* hit a rock near the island of Santorini in Greece; two people disappeared.

In 2010, the International Life-Saving Appliance Code (LSA) was adapted; fixed and inflatable rafts must be designed for passengers with an average weight of 82.5kg instead of 75kg.

In 2012, the *Costa Concordia* also struck a rock, this time near the island of Giglio (32 dead). The Secretary General of IMO stated: " We should seriously consider the lessons to be learnt and, if necessary, re-examine the regulations on the safety of large passenger ships in the light of the findings of the casualty investigation ... In the centenary year of the *Titanic*, we have once again been reminded of the risks involved in maritime activities.." A point on the safety of passenger ships was added to the agenda of the next IMO Maritime Safety Committee to be held next May. Away from the media, in the corridors of the IMO, the cruise industry, represented by the Cruise Lines International Association (CLIA) and the International Chamber of Shipping (ICS), has always wanted to avoid introducing new, expensive safety measures. In this area, insurers are better allies for future cruisers.

In anticipation of the sinking of *Costa Fascinosa* or another Gigantic, insurance companies will reassess the risks and their premiums, which, much more so than the procrastination of the IMO, will have a limiting effect on the size and population of cruise ships. The sinking of the *Costa Concordia* could cost its 28 insurers \$1 billion. Adjusted to inflation, the sinking of the *Titanic* cost insurers €120 million.

Rules and exceptions

The general provisions of SOLAS do not apply to the transport of troops and lay down exemptions for vessels chartered to transport pilgrims. Passenger ships are generally subject to SOLAS and their associated rules according to their year of construction. The oldest are the most vulnerable. Luckily these are not the largest vessels. Realistically, the IMO has planned for the conversion of old cargo ships into a passenger ships, and in this case the date of conversion must be taken into account to determine the applicable regulations. By abuse of language and interpretation, Costa tells their customers that the *Costa Allegra*, a container ship dating from 1969 that recently suffered an engine fire in the Indian Ocean, was built in 1992: its conversion date. Moreover, exemptions to the SOLAS are granted on a case-by-case basis, for example regarding the maximum number of persons permitted in the lifeboats.

Muster points

In the 24 hours following the boarding of passengers, SOLAS imposes muster drills and broadcasts instructions on the use of life jackets and the procedure to be followed in an emergency. In the United States this procedure is mainly applied prior to the departure of the ship, and the experience of the *Concordia* shows that this precaution is not superfluous.

Crews must be trained and prepared for crisis situations (the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers - STCW). The level of training for the captain, officers and seamen differs considerably from that of the majority of the remaining crew comprised of hotel staff, housekeeping, hairdressers, waiters, instructors, coordinators, dancers, knick-knack sellers and croupiers, not forgetting the Special Anti-Vomit Forces, often called upon during the first two days of seasickness.¹ Everyone recognises that this training is inadequate, and that the peaceful mastery of crowd movements or individual erratic behaviour, in exceptional circumstances, where everyone wants to save themselves or their family, ultimately requires years of study and practice. The growth of the sector has also had social consequences and turnover of seamen in the cruise industry is very high, between 25 and 35% per year. Under these conditions it is difficult for the entire international crew to be familiar with the fire-fighting and evacuation procedures, and therefore impossible for them to understand their role and to work as a team to react effectively in a crisis situation. Fatigue and inability to communicate properly in a common language are two human factors that negatively influence reaction during crisis management. People greet each other in English and panic in their own language.

The evacuation

In 2001, the UK Marine Accident Investigation Board published a study identifying more than 100 deaths or accidents during lifeboat evacuations. In response to frequently raised concerns, SOLAS was amended in 2006 so that the presence of sailors on board some boats is no longer required during exercises. Seafarers reiterate, however, that only training in real conditions allows for proper preparation. New provisions taking effect in 2014 will address problems regarding the design and maintenance of lifeboat launch devices of ships launched after May 2011.

The maximum capacity of lifeboats, fixed at 150 people, is not always respected. This is true of Royal Caribbean Cruises, owner of the two largest cruise ships in the world: *Oasis of the Seas* and *Allure of the Seas*. Their lifeboats are sized to each accommodate 370 people. Classification firms and the flag States approve concessions on the basis of simulations which do not take into account the full evacuation process in every circumstance. The first of these super-lifeboats to fall victim to shipwreck

¹ Quoted in the excellent article by David Foster Wallace, "Shipping Out. On the (nearly lethal) comforts of a luxury cruise", published in Harper's Magazine, 2006.

will undertake the major test. However, they are also equipped with toilets; a major breakthrough in the history of sea rescue. Questioned by potential customers on the feasibility of evacuating 8,500 or 4,500 people from a ship in distress, on the risks of crowd movements or the number of people stranded from lifeboats, Royal Caribbean Cruises and Mediterranean Shipping Company did not respond and sent the literature available on board or video links where simulated evacuations always happen in broad daylight, in calm seas and amid a Zen-like atmosphere. SOLAS requires that lifeboats can be launched within 30 minutes of the signal to abandon ship, after the passengers have assembled in their lifejackets at the muster point. The study, by a classification society, shows that following severe collision or grounding, evacuation must be completed within 10 to 15 minutes to achieve a maximum level of efficiency. In case of fire, 60 minutes are available according to the same study. In practice this is difficult, if not impossible in some cases: for instance, the ship may be listing, the incident may occur at night, and often, a quarter of the passengers are over 75 and there are a lot of children. Some officers and experts believe that evacuation of Gigantic in rough seas is simply not feasible, and that the cruise industry wallows in its excesses, to the detriment of the safety of passengers and crew.

Finally, if in their misfortune the shipwrecked passengers have the chance to take their place in lifeboats or survival craft, someone still needs to pick them up. Companies that offer cruises in remote areas, right up to the Arctic, are rarely concerned with external rescue scenarios.

IV - What to expect

Fire, fire, fire.

Fire is the major risk on board cruise ships. Between 1998 and 2011, at least six fire outbreaks were declared on board cruise ships carrying more than 3,000 "guests" and crew. The reasons for these were numerous and were, potentially, the fault of the passengers and crew. Fires often start in the engine room, more specifically in the crucial electricity generator area.

For example, the fire on board the *Carnival Ecstasy* ravaged the stern of the ship. The company said the source of the fire outbreak was the crew's laundry room. Welding operations were underway. Smoke and flames spread to decks 1, 2, 3 and 4, the mooring deck. Pallets of polypropylene ropes then caught ablaze, massively accentuating the severity of the accident. The fire took place in sight of Miami. The vessel's engine stopped. Simultaneously, the captain stated he did not need outside assistance. The Port of Miami, however, sent tugs and fire fighting ships. It took over nine hours to fully extinguish the fire and tow the vessel back to port. Sixty passengers and crew were poisoned and hospitalised. The official version of events, that negligence in the crew dry-cleaning section was the cause of the fire, was contradicted by the testimony of a mechanic. He said the fire started in the engine room.

Unlike public areas such as shopping centres and in airplanes, smoking in all areas on board of cruise ships, which may accommodate thousands of people, is not prohibited. A cigarette butt, instead of being put out, was thrown from an upper deck and instead of falling into the coastal waters of Jamaica, landed on a cabin balcony below. The fire smouldered in a deck chair and other combustible materials ignited one of the polycarbonate partitions separating the "guests" terraces. The fire spread over three decks and ravaged one hundred cabins. Passengers tried to escape through the corridors. One survivor later said: "Everything was dark and suffocating, it was like an oven, not knowing where to go". Her husband was incredibly unlucky. He died of asphyxiation. Princess Cruises found it judicious in its press release to cite a cardiac arrest.

In 2010, the *Carnival Splendor*, following an engine room fire, drifted in the Pacific Ocean off the coast of Mexico for 24 hours before being towed back to San Diego. The adventure lasted five days for the 4,500 passengers and crew members, who were denied basic comfort and communications.

Sandwiches were supplied by helicopter. A month later, the U.S. Coast Guard issued to all professionals - shipyards, classification companies, insurers, owners, crew representatives, travel agencies - a warning notice indicating that the automatic carbon dioxide system had not worked through the fault of defects, corrosion, misleading operating procedures and deficient training of fire-fighting crew. This failure, which was a bar to total and unequivocal safety in the machine room, raised concerns from experts and Seafarer's Unions alike. On this occasion, the principle according to which "the giant cruise ship is, in itself, the ideal rescue boat" was demolished.

Another fire, to which a Gigantic belonging to major player Royal Caribbean Cruises indirectly fell victim, demonstrated the lack of coordination between the ship and the host port and the unanimous lack of consideration for passengers and crew members. In Gibraltar, cruise ships stop only a few metres from depots for hydrocarbon waste, pumped into the holds of ships and cargo containers. No architect would have had the cruelty or authority to build even the smallest structure in such dangerous conditions, under the European Sevesco Directive. By contrast, the cruise industry, in cooperation with the local Chamber of Commerce, had the great idea, failing anything else, to introduce industrial floating cities - 300 metres long, 60 metres high and housing more than 6,000 residents - with more than 150 stops a year. At the end of May 2011, while welding work was underway on the roof of an oil tank, an explosion and a fireball interrupted the serenity of the stopover. The ship was blown up by the blast wave. Twelve passengers were injured. There was panic on board. At first, people thought they were under attack. The accident happened at around 3:30pm. The ship's departure was scheduled for 4:00pm. It was only the fortuitous circumstance of its imminent departure that allowed the *Independence of the Seas* to escape unscathed.

On-board fires are therefore anticipated and feared. Some causes are unlikely, however; the flashing lights of life jackets have caused two outbreaks of fire in a passenger cabin and in a lifeboat. Stranger still, a lifeboat caught fire due to a short circuit in its lighting device. In all three cases, the Chinese manufacturer was suspected to be responsible.

Crash, crash, crash

Collision is also a major risk for all commercial vessels. But, for cruise ships, it exposes 2,000, 3,000, 6,000, or even 8,000 potential victims to mandatory evacuation, fractures and other trauma injuries, and potentially death.

Ship-ship collisions may occur. The premonition of a large-scale disaster happened at about 2:00am in August 1999 in the English Channel. The event is etched into the minds of experts as the accident that was nearly the Big One. Following an error of attention and navigation, the *Norwegian Dream* collided with another giant, another champion of globalisation: the *Ever Decent*, a container ship in rotation between Asia and Europe, and which that night cut through the Channel to get to Zeebrugge. The vessels collided at full force. The cruise ship hit the container ship's dangerous cargo section. It took emergency services five days to extinguish the fire. The bulbous bow of the *Norwegian Dream* tore the *Ever Decent* in the middle of block No. 3, under the waterline.

Twenty-four people, passengers and crew members were injured on the *Norwegian Dream*. "When I heard the bang, I immediately thought of the *Titanic*. Everything waltzed around us." said Arielle, 16, from New York. Another passenger from Los Angeles, a previous earthquake victim confirms: "It just made us think about a 7.5 on the Richter scale." In the necessary game of "what if" played by experts over ten years later, three major issues were brought to the fore:

- What would have happened if the collision had been reversed, and if the reinforced bow of the container ship had rammed the *Norwegian Dream* at cabin level?
- What would have happened if the two vessels, after the collision, had not separated from each other and if the fire on the container ship had spread on to the cruise ship?
- How, in emergency conditions, would the 3,000 people aboard the *Norwegian Dream* have been evacuated?

For St. Valentine's Day, 2007, "guests" were enjoying a short cruise. Just before boarding, the ship was hit by a convoy of barges on the Mississippi. It listed. The company still proceeded to board. Bars and buffets were open. Access to cabins was put back. Some of the 2,000 passengers became worried. After that the crew noticed a 10 metre crack in the hull, and since repairs would take several weeks, all the passengers had to disembark. A further illustration of the century-old motto of the cruise lines summarised by the American press: "The show must go on, even if the boat cannot."

Collisions also hit the ports. Following the docking of the *Costa Europa* disrupted by high winds in the port of Sharm el-Sheik in Egypt, three sailors from India, Honduras and Brazil were killed in their cabins in the lower decks, on a break in a windowless inner cabin where a normal bureaucrat would be reluctant to install a photocopier. Italian authorities have refused to submit the enquiry report to the IMO, resulting in three confidential deaths.

The see-saw effect

3,500 passengers and 1,200 crew members were aboard the *Crown Princess*, a brand new ship built in Italy. There was calm weather on leaving Florida. Destination: New York. Twice the ship suddenly and violently listed starboard. The pools drained. Waves of passengers, tables, chairs, bottles, bags and personal and decorative items all surged to the right wall. Nearly 300 passengers were more or less seriously injured - broken bones, cuts, open wounds. The departure port authorities were notified... by a passenger at 3:50 p.m., 25 minutes after the panic. Coast Guard made contact with the ship around 4:00 p.m. The company instructed the Coast Guard that the vessel should return under its own power to Port Canaveral from where it left two hours before. The Coast Guard verbally prohibited the ship from entering the harbour without verifying the vessel's manageability with their own eyes. At 6:36 p.m., the *Crown Princess* docked. The accident, according to the investigation report, was due to incorrect operation by the captain and his crew of the autopilot system produced by a German company. Rather than insisting on a lack of training and collective learning, the company chose to highlight the sole responsibility and human error of a second officer who was "immediately relieved of his duties".

In 2010, another Gigantic navigating the middle of the Gulf of Mexico had to make an emergency manoeuvre to avoid an "obstacle" that had not been identified by radar and had not been visually detected from the bridge. On the contrary, some passengers claimed to have spotted it and found that the ship was heading straight for it. The Gulf of Mexico is littered with floating buoys and various markers indicating shipwrecks, explosives or industrial waste disposal sites or locations to be used in the future for anchoring platforms for gas or oil exploration. All these obstacles are mapped. At the last moment, the *Carnival Ecstasy* tacked, causing the ship to list violently to portside. Sixty passengers were injured.

Running aground

Gigantics are venturing where they should not go. The *Costa Concordia* ripped its hull on a rock on the island of Giglio on January 13th, 2012. Three days earlier, the *MSC Poesia* ran aground on a reef approaching Port Lucaya in the Bahamas. It was a trial visit, a sort of preview for validating scheduled landings on the island of Grand Bahama. A total of 2,500 passengers gathering for a musical cruise hosted by 20 DJs were used as guinea pigs. At 7:00 a.m., a big boom woke everyone up, causing glasses, dishes and television sets to be thrown around and passengers to panic. Refloating attempts by four big tugs were eventually successful after 15 hours of effort, jolts and tremors.

"The arrival of large cruise ships is a flagship project to develop tourism. It was a test, we hope to still be able to put it into action" said the president of the Port of Grand Bahama soberly after the accident.

There was no local pilot on board and Mediterranean Shipping Company has not explained the causes of the incident and consequences for the ship and the environment.

Cruise ship or floating hospital

Gastroenteritis epidemics and the transmission of other infectious diseases are relatively common on board the Gigantics. They are resistant and recurring. They spread to hundreds of people including crew members, which inevitably reduces the ability to organise and react if another event occurs which compromises safety and imposes evacuation. Gastroenteritis is distinguished by the sudden onset of vomiting and/or diarrhoea. Worst case scenario: 80% of passengers may be affected. Food, water and physical contact contribute to the transmission of the disease. Episodes persist despite the provision of liquid and gel dispensers in strategic locations and the repeated use of surface disinfectants. The ship's medical team may decide to quarantine sick passengers until 24 hours after the last symptoms have disappeared. According to independent experts in the cruise industry, a ship carrying thousands of people is an ideal incubator and there is no fully effective protocol that can prevent the spread of infectious diseases in such overcrowded and confined environments. The same problem is found in refugee camps. The main conditions observed and reported are Legionnaires' disease, gastroenteritis transmitted by noroviruses, e.coli and shigella flexneri 2a, meningitis, swine flu, SARS (Severe Acute Respiratory Syndrome) and salmonellosis. Disinfection of the vessel when at sea is not possible. The process is carried out in port: cushions and blankets are incinerated; anything that passengers and crew could touch, dishes to casino chips, is disinfected, and chlorine is sprayed over all levels of the ship. The thorough cleaning takes a week. It includes the full decontamination of the air conditioning system.

The medical services of shipping companies say that outbreaks on board occur because of passengers who are contaminated before they board. Companies do not systematically report these events to the health authorities of destination ports. They want to avoid cancellations and heavy financial burdens caused by immobilisation of the vessel, quarantine of passengers, their transfer, their repatriation and their refund. Spain, Australia, Antigua, St. Lucia and New Caledonia have banned stopovers and passengers disembarking who were susceptible to facilitate, both on board and in the host country, the transmission of H1N1.

Despite successive fatal incidents or episodes requiring emergency hospitalisation, the elderly, who are particularly vulnerable, are not informed in advance and are welcomed aboard with a warning in the cabin summarising precautions to be taken to prevent as much as possible contraction of the virus; the same goes for children. The fine that may be imposed on the cruise organiser by the authorities of the port of call after failure to declare an epidemic is not especially dissuasive. The figure of \$30,000 was set by health authorities in London, UK. Gastroenteritis is also very active on cruise ships in the United States. During the first quarter of 2012, according to the Centers for Disease Control and Prevention, 7 gastroenteritis epidemics on cruise ships calling at U.S. ports were recorded.

Sources of infectious -and to some extent devastating- diseases are numerous: water supplied to ships in some ports may be contaminated, and inadequate disinfection protocols for sanitary drinking water in long and complex circuits contaminated by wastewater may also be the cause.

For Legionnaires' disease in particular, the spread of the virus is facilitated by the stagnation of water, changes in ambient temperature, water storage conditions and level fluctuations caused by the rolling and pitching of ships. Legionella bacteria also thrive in swimming pools and spas, if the water is poorly filtered and the pipes are inadequately cleaned and disinfected.

Two months ago, a 30 year old waitress disembarked from the *MSC Armonia* in Santos along with ten other passengers and crew. For a few days she had had breathing problems and, according to colleagues, had not received appropriate care from the ship's doctor. This Brazilian beauty died two days after being admitted to hospital.

The target

On board these floating cities, in a closed gathering, thousands of people are there for the occasion. Thefts, verbal and sexual abuse, alcoholism and swindling do not miraculously disappear the moment you walk across the gangplank to a cruise liner. There is no truce on board, or in the ports of call. Furthermore, large cruise liners are ideal targets as part of sociological, symbolic, moral and

statistical terrorist projects. In 2010, in the United States, one Government agency (Government Accountability Office, GAO) called for the strengthening of general security measures on cruise ships and a prior transmission of the details of all passengers to Customs. According to the report, "a successful attack on a large cruise ship in U.S. waters, or adjacent to them, would result in the closure of a U.S. port, would deter potential passengers and seriously damage the U.S. economy". The GAO found that even if the intelligence services have no recent evidence on the implementation of such projects, the fact remains that these services have identified groups capable of engaging in such initiatives. The case of the *Scandinavian Star* will go down in history. It was caused by a Danish pyromaniac, who died because of the fire, as noted in the official report. Without the scale of terrorist scenarios, individual or concerted actions of malice can take place in any apartment building and especially in an isolated and confined area such as a cruise ship, with tragic consequences.

V – How will you pollute?

A cruise ship with 3,000 passengers and crew on board produces in a week around 800,000 liters of sewage originating from toilets, 4 million liters of greywater originating from showers, sinks and laundry, 90,000 liters of bilge water containing hydrocarbons, more than 800 liters of hazardous liquid waste, 40 tons of non-hazardous solid waste and one or two tons of hazardous solid waste.

In September 2005, three crew members from the *Monarch of the Seas* died, and 19 others were poisoned after inhaling methane gas. They worked on a section of piping connected to the wastewater system. Unperturbed, the spokesperson for Royal Caribbean declared the same day that he believed the Mexico-bound cruise would continue as planned. After this accident, the *Monarch of the Seas* may have dumped into the seas tons of contaminated waste before proceeding to the drydock for new maintenance operations.

Wastewater, or sewage, also known as "black water" is full of excrement, urine, and a cortege of bacteria, including fecal coliform, pathogens, and viral germs and pharmaceutical residues especially when there is a gastroenteritis outbreak aboard. Toilets are generally connected to treatment equipment. Water, more or less purified, is then dumped into the sea. Nitrogen and phosphorous facilitates the proliferation of toxic plankton and algae. Inspections are rare, except in Alaska (USA), where in 2009, 72% of inspected ships dumped water in excess of regulated limits, the Gigantic from Princess Cruises being the leaders. Since then, the tendency is to dump polluted water off the coast of British Columbia (Canada), but in 2010, under pressure from the cruise industry which threatened to reduce the number of stopovers, the rules on the dumping of wastewater into Alaskan seas were relaxed. Business makes the law in Alaska, just like in the Mediterranean.

The majority of **greywater** comes from sinks, baths, showers, laundries, and kitchens. They are generally dumped directly into the sea and are rarely sent through the treatment network for wastewater. They are full of residue from personal hygiene products (soap, suntan oil, etc.) and detergents, but also bacteria, heavy metals, phtalates, and chlorinated products. These chemical and bacterial micropollutants degrade the sanitary state of marine organisms.

Bilge water is a mixture of water, hydrocarbons, lubricants, degreasers, detergents, and other fluids leaking from, for example, engines and motors. They must be stockpiled before unloading to a land-based facility or being treated on the ship before being dumped into the sea. The absence or deficiency of the treatment of this complex mixture is the most common source of marine pollution by the cruise industry. The habitual violation of environmental regulations consists of making false declarations ship's Oil Record Book in order to dissimulate intentional discharges into the sea. Journeys made by Gigantic are repetitive, and the waste they generate accumulates around their habitual courses.

Perchloroethylene from drycleaning, pharmaceutical waste, used batteries, paint and aerosol forms the principal flux of **hazardous waste** on board. In 1999, while ships were less Gigantic than today, Royal Caribbean Cruises estimated that in one week, each one of its ships was producing 850 liters of paint waste, 930 kilograms of chemical products, 36kg of medical waste, 263kg of used batteries and 120kg of fluorescent tubes. The stockpiling of this dangerous waste could constitute a deadly source of toxic fumes in case of a fire or if they are incinerated on board.

Waste from plastic packaging, bottles, paper, glass, cardboard, food waste, and non-submersible waste are stockpiled on board or incinerated. In June 2011, a dumping ground was discovered in Hawaii. It contained waste from cleaners on board the *Pride of America*. Cruise ships produce 25% of the waste generated by commercial vessels, although only representing a tiny percentage of the worldwide fleet.

Atmospheric Pollution

On board incinerators treat hydrocarbonated mud, sludge issuing from sewage treatment, expired medicine, plastic or cardboard packaging, and food waste. A Gigantic burns up to 2.5 tons of hydrocarbonated waste a day. The difference between these and incinerators on land is that there are no norms for the emissions from on board incinerators. The incinerated ashes are generally scattered into the sea.

A Gigantic of 2,500 passengers emits each day as much atmospheric pollution as 12,000 cars. Cruise ships are then racetracks at the same time that they are thermal plants. They burn diesel oil (12t/h for the largest), gasoline, and heavy fuel oil containing a high level of sulfur. American companies have contested for a long time, before the Courts and to Congress, the decision of the State of California to ban the use of high sulfur fuel less than 24 miles from the coastline. Despite its lobbying efforts, CLIA (Cruise Line International Association) must bend to new regulations from the International Maritime Organization, which take effect August 1, 2012 in the frame of ECA (Emission Control Area). In effect, in the 200 nautical mile limit off the coasts of Canada and the United States, it will be banned to use fuel containing more than 1% sulfur. It is notable that such constraints aiming to ameliorate air quality and the marine environment as well as to protect riversides will not be put into effect for several years in the Mediterranean, in the gulf of Gascony, in Asia, or even in the Southern Atlantic Ocean.

Dredging

So that the Gigantics may access the heart of picturesque ports and historic cities without running aground, local authorities, in cooperation with maritime companies, must enlarge and deepen the surrounding marine areas and access channels. Dredging is done to the detriment of a fertile marine environment for fishers and propitious to the maintaining of marine biodiversity. The protectors of the environment and heritage of Key West in South Carolina, and those who are promoters of local business, are in conflict over this subject – Key West receives each year 800,000 passengers, an invasion in regards to the 25,000 permanent residents.

Affecting the Landscape

‘See Venice and die’ or ‘Die rather than see an skyscraper in Venice’? Classified as the worldwide heritage of humanity, Venice sees Gigantic disembark in its lagoon, which cast a shadow over its palaces. The European Landscape Convention notes in its preamble that ‘Noting that the landscape has an important public interest role in the cultural, ecological, environmental and social fields, and constitutes a resource favourable to economic activity and whose protection, management and planning can contribute to job creation.’ So what are they doing there?

VI – The *Titanic* and the Gigantic by Joseph Conrad, sailor and author

Extracts from “Some Reflections on the Loss of the *Titanic*” 1912 and “Certain Aspects of the Admirable Inquiry into the Loss of the *Titanic*” 1912.

« The fact that the water-tight doors in the bulkheads of that wonder of naval architecture could be opened down below by any irresponsible person. Thus the famous closing apparatus on the bridge, paraded as a device of greater safety, with its attachments of warning bells, colored lights, and all these pretty-pretty, was in the case of this ship, little better than a technical farce ».

« The *Titanic* was only partly divided. She was just sufficiently divided to drown some poor devils like rats in a trap ».

« To be drowned shut up under deck is too bad. Some men of the *Titanic* died like that, it is to be feared. Compartmented, so to speak. Just think what it means ! Nothing can approach the horror of that fate except being buried alive in a cave, or in a mine, or in your family vault ».

« The men responsible for these big ships have been moved by considerations of profit to be made by the questionable means of pandering to an absurd and vulgar demand for banal luxury –the seaside hotel luxury ».

« Don't sell so many tickets, my virtuous dignitary. After all, men and women (unless considered from a purely commercial point of view) are not exactly the cattle of the Western-ocean trade, that used some twenty years ago to be thrown overboard on an emergency and left to swim round and round before they sank ».

« Do not let us take a romantic view of the so-called progress. A company selling passages is a tradesman: though from the way these people talk and behave you would think they are benefactors of mankind in some mysterious way, engaged in some lofty and amazing enterprise ».

« A commander should be able to hold his ship and everything on board of her in the hollow of his hand, as it were. But with the modern foolish trust in material, and with those floating hotels, this has become impossible. A man may do his best, but he cannot succeed in a task which from greed, or more likely from sheer stupidity, has been made too great for anybody's strength».

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