Passenger ship safety since 1912

By Nigel S. Greenwood
Greenwood Maritime Solutions Ltd.

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The past year has drawn public attention to the subject of passenger ship safety in two very striking ways. The first, the centennial of the *Titanic* sinking, needs little further comment. Indeed, the profusion of popular histories of the *Titanic* tragedy might induce a casual observer to suspect nothing much else had happened in sea-travel since then. But the second, the *Costa Concordia* sinking last January, was a cautionary signal of how quickly and easily catastrophe can occur even in this day of enhanced navigation aids.

Remarkably in the *Costa Concordia* case, the loss of life was not on the same scale as the *Titanic*. This is in many ways due to the improvements in passenger ship safety over the intervening 100 years. Nonetheless, the event has drawn a lot of attention to the state of risk management and accident-prevention in the industry.

History

Even leaving aside wartime losses, the *Titanic* was by no means the greatest maritime tragedy of this past century. That dubious distinction belongs to the MV *Dona Paz*, in which 4,341 people lost their lives in a collision with a gasoline tanker near the Philippines on December 20, 1987. The century is in fact distressingly full of peacetime marine disasters approaching or exceeding the *Titanic*'s losses: the *Toya Maru* was lost in a typhoon in 1954 with 1,153 persons; the *La Joola*, a Senegalese ferry, capsized in 2002 with more than 1,800 passengers onboard; and the *Al Salaam Boccaccio 98* sank in the Red Sea in 2006, taking with her more than 1,000 souls.

There are even some salient examples in home waters: the *Empress of Ireland*, lost to collision in 1914 in the St Lawrence River with 1,012 lives, and the *Princess Sophia* lost in 1918 on Vanderbilt Reef in Alaska, with 353 lives, the greatest maritime disaster in the Pacific Northwest to date. Another one, in which similar losses were averted, was the burning and sinking of the *Prinsendam* in the Gulf of Alaska in 1981. Miraculously in this last case, the entire complement of 510 passengers and crew was saved.

This brief, incomplete, record of maritime disaster in the last 100 years might suggest to some that sea-travel is still hazardous. The examples chosen illustrate the full range of shipping risks: storms, capsize, fires, groundings, collisions, and hazardous cargoes. Nor are the majority of these during the earlier part of the period; many of the more shocking examples are comparatively recent. Indeed, the increasing numbers of people travelling recreationally might lead one to expect that the likelihood of casualty is increased. But what do the statistics say about trends in the passenger-shipping industry?

Trends

In the hundred years since *Titanic*, the world fleet of ships has tripled in number to over 100,000 ships, for a total tonnage of more than a billion. Many of these ships are significantly larger, especially cruise ships; while *Titanic* carried a total complement of 2,224, cruise ships now routinely carry 3,000 while the largest ships carry up to 7,500 persons.

In 2011, the passenger-carrying component of the world fleet totalled 4,131 ships of over 300 gt, a combined gross tonnage of 34.8 million. Of this total tonnage, 47 per cent was comprised of cruise ships. Notwithstanding the recent additions of large cruise ships, the passenger fleet is the oldest component of the total merchant fleet, with pure passenger and passenger/RO-RO ships averaging 21 and 24 years of age respectively. Over 1,600 of these ships were older than 25 years, while between 21 and 26 per cent were built in the last 10 years. The larger passenger (cruise) ship segment is the youngest part of the fleet, with all ships of over 100,000 gt being built in 1998 or later, and 15 more of over 80,000 gt

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Capacity of the cruise industry alone in 2013 is estimated to be over 238,000 berths in 282 ships. With ships on order, this is expected to increase for a projected total annual cruise population of over 23 million by 2015. The demographics in the cruise sector reflect an older, largely retired passenger, with 36 per cent of age 45-59, and 35 per cent over 60, which could create concerns for mobility in evacuation.

Notwithstanding increases in the world fleet, the overall rate of ship losses has decreased over the century from one in100 per year in 1912 to one in 670 per year in 2009. Some claim that cruising by sea is one of the safest modes of transport, with only 28 fatalities due to operational causes (ie: fire, collision, grounding or sinking) in the decade before the *Costa Concordia* incident. This equates to 0.16 fatalities per million passengers, a rate about half that attributed to airline travel. However, others point to selective statistics to challenge this claim. Whatever the truth, it is clear that safety remains a key concern of the travelling public and a primary responsibility of the industry.

Safety changes, continuous improvement…

In fact, many changes have taken place to greatly enhance passenger safety and comfort. These changes are both technical and operational, with a very high premium being put on continuous improvement across the industry.

The *Titanic* incident itself was followed closely by an international convention to establish standards to improve the safety of seafarers and passengers. Since 1914, the Safety of Life at Sea Convention (SOLAS) has specified appropriate standards for live-saving equipment, ship construction and survivability, navigation equipment and practices, and communications. In recent years, SOLAS and related conventions have further detailed codes to deal with Dangerous Goods Carriage, Safety Management Systems, and Ship and Port Facility Security in response to evolving concerns.

Navigation (in the comprehensive sense of good geographical positioning as well as collision-avoidance) has also been an area of significant improvement over the past century. The institution of the International Ice Patrol, to track and warn ships of iceberg hazards in the North Atlantic, was another outcome of the initial SOLAS convention. The later development of radar helped in this particular task, as well

as facilitating collision avoidance and landfall. The Second World War also enhanced navigational precision with the subsequent development of electronic positioning aids such as Consol, LORAN, and OMEGA. Nowadays, we take it for granted that ships can know their position within metres, continuously, and in all weather, thanks to GPS and inertial navigation systems. Recent additions to navigational aids include AIS, such that the position, identification and course/speed of unseen vessels in one's vicinity can be ascertained directly from their own transmissions. And in addition, most of the more heavily travelled sea lanes are overseen by Vessel Traffic Services, which impose another layer of oversight, warning and guidance to shipping.

The human end of the safety-at-sea equation has also been addressed over the years. The 1978 Convention on Training and Certification of Watchkeepers (STCW) generated common, appropriate and compatible standards for certification of seafarers. Enforcement was aided by the publication of a "White List," thus identifying by omission those countries whose seamen might be subjected to more stringent flag or port-state inspection. This effort at global professionalization of the marine industry was incentivized by many players, be they governmental, legal, technological, economic or professional interests. The Nautical Institute is a key player in this from its London base, providing input to the continually evolving conventions of the IMO and publishing a wide range of educational publications across the maritime domain.

It is therefore timely and appropriate that the spring conference of the BC Branch of the Nautical Institute will be devoted to the topic of Passenger Ship Safety.

With all this effort to promote, program and regulate the safety of global shipping, it would seem that there is no room for human or technical mishap. And yet, accidents continue to happen. Why is this? There are many reasons that accidents transpire and the whole science of accident causality, human failure and risk management is not just another article, but a library in itself! Suffice to say at this point that accident prevention requires not just *post-facto* investigation, but a sustained effort at self-examination and continuous improvement, as well as a generous spirit in sharing best practices.

Conclusion

It is therefore timely and appropriate that the spring conference of the BC Branch of the Nautical Institute will be devoted to the topic of Passenger Ship Safety. The very topical nature of this subject may be indicated by the fact that a Google search of just this term yields 2.48 million hits!

The conference will take place in Victoria, at the Marriott Hotel, on May 9 and 10, 2013.

Through involvement of all sectors of the passenger-carrying marine industry, from whale-watching to mega-cruise ships, and from eco-tourism to major scheduled ferry services, the conference will examine how the industry is proceeding by continuous improvement to provide a safe experience for the travelling public. This will include discussion of both operational and technological aspects and innovation, providing value for widely varying interests.

More information can be had by accessing the conference website at: www.nibcconference2013.com.

Subsequent articles in BCSN over the next few months will further elaborate on the scope and agenda of this important conference.

Nigel Greenwood is a retired Rear-Admiral RCN, a Master Mariner, and a member of the Nautical Institute. He consults in the maritime industry from Victoria, and at: www.GreenwoodMaritime.com.

Passenger vessel safety is the focus of the upcoming conference of the BC Branch of the Nautical Institute. Details can be found at www.nibcconference2013.com. (Photo credit: BC Shipping News.)