



## Safer ships: lifesaving and fire protection at sea

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It took a major disaster to focus the world's attention on the need for internationally recognized standards for safety at sea. It was the April 1912 sinking of the RMS Titanic after colliding with an iceberg in the North Atlantic, that led to the first International Convention for the Safety of Life at Sea (SOLAS) in 1914, requiring lifeboats for all on board, and a host of other safety measures. Although World War I prevented its ratification, it led to another SOLAS convention in 1929, and eventually the establishment of the International Maritime Organization (IMO), a specialized agency of the United Nations devoted to development of international legislation in pursuit of safety and prevention of pollution at sea.

### Destination or transportation?

In recent years cruise ships, especially, have continued to grow in size and complexity. Such ships operating and under development today are half again as long and three times the tonnage of the Titanic, and the number of persons on the largest is approaching 10 000. The ships have become destinations as much as transportation, continually adding features and amenities to provide a diverse and pleasurable experience for passengers on board. Passenger demographics have changed as well, with increasing numbers of children and the elderly enjoying the cruising experience. Finally, there is growing demand for cruises to remote or extreme locations far from search and rescue resources.

With all of these changes, it can be a challenge for the international reg-

ulatory regime to keep pace. In recent years, as IMO has taken up new wide-ranging initiatives to address such issues as the role of the human element in maritime safety, safety management systems, the development of ever-larger passenger ships, and most recently, maritime security, there has been a continuing need for development of technical standards in support of those initiatives.

### ISO frees IMO

This is where ISO/TC 8, *Ships and marine technology*, steps in. As the recognized single point of contact between ISO and IMO, the ISO/TC 8 and its subcommittees focus primarily on development of International Standards in support of IMO. TC 8/SC 1, *Life-saving and fire protection*, in particular supports the IMO subcommittees on ship design & equipment, and

### About the author



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## Main Focus

fire protection. In addition to allowing greater engagement in the process by the affected industries, and greater consideration of market factors, development of needed detailed technical standards within ISO frees IMO to concentrate its resources on adoption of high-level international legislation.

A premise of IMO regulations governing ship stability and fire protection is that a ship should be its own best lifeboat. But there are sometimes situations where abandonment of the ship is unavoidable. Obviously, the egress of perhaps thousands of passengers distributed throughout a large ship with many decks, potentially through smoke-filled passageways, to assembly stations for lifeboats and life rafts is a daunting task.

This requires the ship designer to give careful consideration to the layout and marking of the ship and its escape routes, which can be complicated by common design features of modern ships such as large, open atriums spanning numerous decks, and the variety of languages spoken by both passengers and crew. Several standards providing guidance in this process have been developed or are under development by TC 8/SC 1/WG 3, *Fire protection*. ISO 15731, *Ships and marine technology – Low location lighting on passenger ships – Arrangement* specifies performance, installation, and maintenance of low-location lighting systems used to provide way guidance in smoke-filled conditions, and has been implemented internationally in IMO instruments.

### Signing and surviving

Surprisingly, there is little in the way of specific regulatory guidance for shipboard safety signs—and unfortunately, bad examples abound. To fill this gap, a three-part standard, ISO 24409, *Ships and marine technology – Design, location, and use of shipboard signs for fire protection, life-saving appliances, and means of escape* is currently under development in liaison with ISO/TC 145/SC 2, *Safety identification, signs, shapes, symbols, and colours*. It aims to harmonize shipboard signing to the extent possible with



Redundant signs may hinder the safety of those onboard the ship.



Marine evacuation systems chutes are used to evacuate a large number of people within a 30-minute evacuation time.



Carnival Cruise liner "Ecstasy" (July 1998).

Good directional signs can help reduce the time needed to evacuate a ship.



standard shore-based signing systems, with which many if not most passengers will be familiar. Other significant standards under development in WG 3 address shipboard fire-fighters' outfits, breathing apparatus for fire-fighting and emergency escape, and point-type resettable flame detectors.

Unlike the "unsinkable" Titanic, which carried lifeboats for only about half the people on board, in the rare instances when a modern ship must be abandoned there are survival craft for everyone, with substantial excess capacity. Most of these survival craft are in the form of lifeboats, with the remainder consisting of inflatable life rafts stored uninflated in canisters.

**“Ships have become destinations as much as transportation, continually adding features and amenities to provide a diverse and pleasurable experience for passengers on board.”**

Until fairly recently, life rafts were generally of the davit-launched type, suspended over the side under davits and boarded at the embarkation deck, then lowered to the sea by wire rope. However, because such life rafts are limited in capacity, and can only be launched one at a time, it can be difficult to achieve the 30-minute evacuation time required by SOLAS, as the number of persons on board increases. Consequently, in recent years there has been increasing use of marine evacuation systems (MES), where evacuees descend to a floating inflatable platform by either an inclined slide (like those used in aircraft), or a vertical fabric chute (like those sometimes used by fire-fighters to exit from tall buildings), then transfer from the platform to inflatable life rafts floating alongside. Typical capacity for an MES is on the order of 400 persons in 30 minutes, or as much as 8 x 50-person life rafts – and because the life rafts do not need to be suspended under load, fewer, larger life rafts can be used.

All photos courtesy of the author.

To ensure the safe and orderly flow of persons through an MES, effective communication between the top and bottom is essential, and required by SOLAS. However, in practice this has been accomplished by a variety of means, and with varying degrees of effectiveness. TC 8/SC 1/WG 1, *Life-saving appliances and arrangements*, has therefore recently taken up development of a new standard to specify the desired performance for means of communication for MES.

### Fit for the purpose

After the occupants have boarded a lifeboat or life raft, they will find a variety of equipment provided to aid in survival, including emergency food rations and drinking water, distress flares and smoke signals, fishing kits, first aid kits, sea sickness medication, and other equipment to permit survival for several days to a week.

However, for many of these items IMO has not established specific requirements, leaving them up to individual maritime administrations. As a result, their quality and effectiveness varies, and ships can find it difficult to obtain suitable replacement equipment in foreign ports. To address these problems, WG 1 has recently completed development of a comprehensive standard ISO 18813, *Ships and marine technology – Survival equipment for survival craft and rescue boats*, that prescribes agreed specifications for this equipment.

Due to a complex and ever-evolving system of preventative measures, a trip on a cruise ship is normally safe and uneventful (at least from a safety standpoint). Most of the equipment for which TC 8/SC 1 develops standards is unusual in that we sincerely hope it will never need to be used, or in many cases even seen, by the travelling public. We look forward to continuing to work in the service of and in cooperation with IMO, to ensure that in the very rare cases when it is needed, it is fit for the purpose and meets the needs of the market. ■