

## **Manning Drawbacks in Evacuation of Passenger Ships**

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### **Abstract:**

*Recent Ro-Ro passenger ships accidents, particularly, in Egypt such as Al-Salam Boccaccio 98 carried a lot of fatalities, suffer of losing beloveds and perhaps total loss of assets, which alert us of the need to ensure consistency in rules that apply in the maritime community, irrespective of ship's flag.*

*This paper reviews some of the difficulties, problems and hindrances encountered by passengers and crew during evacuation of a ship. Moreover, the objective of this paper is to address the safe manning issue during the abandonment of passenger ships.*

*Additionally, it identifies the gaps in international and national regulations and it examines the need to reconsider the minimum applicable maritime safety standard applied on board passenger ships, particularly the minimum safe manning with regard to life saving appliances.*

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## **1. Introduction**

Significant marine disasters always alert the maritime community to look for new changes to improve existing maritime safety measures, which would enable a safer and easier evacuation of ships during emergencies. The tragedy of Al-Salam Boccaccio 98 addressed the necessity of reviewing current safety requirements. Moreover, the underlying causes of that disaster triggered a lot of arguments and the likelihood of recurrence of similar accident in the future cannot be ignored. This is even more than a problem of large passenger ships, with planned carrying capacities of several thousand of passengers that the maritime community is called to adopt new practical measures properly before such disasters occur.

Consequently, the evacuation process comes with a series of difficulties that passengers and crew would face and overcome, for example, boarding lifeboats or sliding down a Marine Evacuation System (MES), launching the survival crafts, surviving in a craft at sea and boarding a rescue ship. However, the need to safely evacuate a large number of passengers within very short time from a confined superstructure is a difficult task of great practical interest that relies on many aspects, e.g. ship's design, applicable and practicable emergency plans, adequate resources of emergency equipment and sufficient number of qualified and experienced seafarers.

This requires a passenger ship to be safely manned, therefore, undertaking the emergency duties and responsibilities would be easier. The process of safe manning is an important issue for routine operation and also for dealing with emergencies situations, which may lead to ship's abandonment. Safe manning is defined by the International Maritime Organization (IMO) as a function of the number of qualified and experienced seafarers necessary for the safety and security of the ship, crew, passengers, cargo and property and for the protection of the marine environment (IMO, 2003).

## **2. International standards affect the minimum safe manning level of a ship.**

IMO instruments such as the International Convention for Safety of Life At Sea (SOLAS), the International Convention of Standards of Training, Certification and Watchkeeping for Seafarers (STCW), and the Collision Regulation Convention (COLREGS) have a direct impact on manning requirements for vessels and Watchkeeping practices on board merchant ships. The following outlines the requirements of the SOLAS, STCW conventions and the principles of safe manning addressed by IMO Resolution A.890 (21).

SOLAS Regulation V/14 requires certain ships engaged on international voyages to be "sufficiently and efficiently" manned and also requires issuance of a document of safe manning to be issued by the flag-state.

SOLAS Regulation III/10 requires all ships under this convention to have sufficient number of trained persons on board for mustering and assisting untrained persons, and also requires a sufficient number of crew members, who may be deck officers or competent persons, on board for operating the survival craft and launching arrangements required for abandonment by the total number of persons on board.

Another important instrument in determining the minimum safe manning of a ship is the STCW convention. It aims to achieve uniform standards of training, certification and Watchkeeping in terms of quality and competence. This convention has been ratified by most of the maritime nations; therefore it has global acceptance. STCW requires any ship to have the capability to maintain safe navigational, engineering and radio watches in accordance with Regulation VIII/2 of the 1978 STCW Convention, as amended, and also maintain general surveillance of the ship (Kumar, 2000).

STCW requires also any person assigned as a person in command of survival craft to possess a certificate of competency. Although, STCW requires seafarer serving on certain types of ships such as ro-ro passenger ships and other passenger ships to hold special certificates in specific functions related to safety, care of persons, or cargo.

Bridge Watchkeeping safety study of the Marine Accident Investigation Branch (MAIB) reveals how a large number of the accidents were the result of watch systems. The study concludes that the current provisions of STCW convention in respect of safe manning, hours of work and lookout are not effective (MAIB - 2004).

However, STCW specifies minimum training and qualification levels for ship's crew mainly based on ship's gross tonnage; there is no determination of required number of crew to carry out such functions related to number of passengers or number and type of survival craft. Moreover, STCW allows a solely person to hold many certificates of competency e.g. a certificate of proficiency in survival craft, proficiency in fast rescue boat, GMDSS (GOC) and passenger ship crowd management, as assigned in charge of carrying out all these tasks, at the same time, in case of emergency during determination of safe manning scale and capacity.

Furthermore, IMO adopted many resolutions concentrate on principals of safe manning to be observed by governments in determining the minimum safe manning of a ship such as Resolution A.890 (21) as amended by Res A.955 (23). In reality, those resolutions are not widely considered mandatory by many flag states in determining the minimum safe manning level of a ship; in the same way, International Safety Management (ISM) Code requires companies to ensure that each ship is manned according to national and international requirements.

### **3. National legislation**

For many of these instruments, IMO has not established specific requirements, depending on the individual maritime administrations satisfaction. As a result, effectiveness of safe manning varies; countries amend their national legislation to meet the international standards regarding watchkeeping, which mainly based on ship's gross tonnage and its engine power capacity.

Accordingly, governments issue safe manning documents for their national ships, which contain the least number of crew needed to safely navigate a ship from a port to another. Therefore, shipowners assign the specified number of crew on board, expecting from them to carry out cargo and passengers' related tasks, such as cargo lashing, routine ship maintenance, housekeeping, mustering and evacuation of passengers, *inter alia*. As a result, ships are considered to be safely manned regarding compliance with such documents , that is clearly unsafe (Holder, 2006).

To ensure safe and orderly evacuation, greater consideration of safe manning factors, development of needed detailed standards frees maritime community represented by IMO to concentrate its resources on adoption of high-level international legislation.

#### **4. Manning situation on passenger ships today**

##### **(i) Case Study 1:**

A 6850 GT passenger ship Jamaa II engaged on international voyage in the red Sea, flying flag of Honduras, Number of passenger 1006 and total number of persons on board 1066. Jamaa II is typically manned with a safe manning document issued on Feb. 2007 and expires on Oct. 2010 that requires number of crewmembers as specified in Table 1:

**Table 1: Minimum Manning of M/V Jamma II.**

Master	1
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Deck Officers	2
Seamen	6
Engineers	3
Oilers	4
<b>Total</b>	<b>16 Persons</b>

Source: M/V Jamaa II, 2007

The ship equipped with 5 motor life boats - open type, which need 3 competent crewmembers, who are supposed to hold certificates of proficiency on survival craft, for each life boat. Moreover, the ship is equipped with 1 fast rescue boat that needs at least 2 competent crewmembers, 3 liferafts, normally need 1 crewmember per each, and 3 MES, which normally need 4 crew per system, in addition to, 1 crewmember for each life raft associated with the system. Depending on the ship's layout, design and escape routes arrangements, a sufficient number of crew are to carry out evacuation tasks and crowd management. In other words, the passenger ship Jamaa II safety certificate requires that 80 passengers would be capable of being supported by ship's crew (16 crewmembers). Insufficient number of crew would be available for launching and operating survival crafts in case of ship's abandonment.

Unfortunately, the ship is considered to be safely manned if it carries not less than 16 persons and grades/capacities stated in the safe manning document.

### (ii) Case Study 2:

Alkahera and Alriyadh are 2 High speed sister passenger ships, recently registered in Egypt on the trade pattern in the red Sea between Egypt and Saudi Arabia ports. Each of the ships certified to carry 1200 passengers and 18 crew members, in different ranks, with total capacity of 1218 persons. Each ship carries 2 fast rescue boats, 8 life rafts and 6 MES(s) that to be deployed with only 18 persons, as per the safe manning document. Obviously, a safe and easy evacuation of ships during

emergencies will face a great practical complexity because of insufficient crewmembers.

### (iii) Case Study 3:

The 11,779 GT Panama registered RORO Passenger vessel, Al-Salam Boccaccio 98 sank almost 57 miles from its port of destination, the Egyptian port of Safaga in the red sea. There were 1031 lost lives; only 387 persons, including 24 crew members were rescued in this disaster. The M/V Al-Salam Boccaccio 98 was equipped with sufficient survival crafts, which consist of 10 open type life boats, 2 of which with engines, in addition to 94 liferafts. The ship's safe manning document required a minimum of 80 crewmembers to be employed onboard and actual crew on board was 97, which is less than the total number of survival crafts on board. It was reported that the vessel caught fire in the RORO deck. The Master and the crew of the vessel tried to battle the fire for about 4 hours; there were no issuance of a muster or evacuation orders. Eventually, M/V Al-Salam Boccaccio 98 capsized at 2333 UTC on February 2, 2006. Unquestionably, the master and 96 crewmembers have no capability to fight the fire and to muster the 1321 passengers, prepare the 36 years old ship for evacuation of the passengers on board promptly and simultaneously (IMO,2009).

## 5. Passenger ships abandonment

Ship's abandonment can be divided into three main stages: Recognition, reporting and evacuation;

- a) **Recognition** is a process of finding out and evaluating the nature of an emergency situation by ship's crew; including realizing the needs of mustering and evacuation of passengers and crew. Failure to recognize is one of the prime causes of maritime disasters. The Herald of Free Enterprise, Estonia and Al-Salam Boccaccio 98 capsize occurred because of a developed

emergency was not recognized in a timely manner (Passenger Ship Safety Guidelines, 2007).

- b) **Reporting** an emergency is an important factor that includes internal and external communications. There are many factors that affect the efficiency of reporting like availability of communication equipment on board, sufficient competent crew e.g. radio operator or deck officer holding a certificate as per IV/2 of STCW. Accurate and early time of report of an emergency situation both internally, to the crew and passengers, and externally, to the company, SAR and authorities, *inter alia* (Passenger Ship Safety Guidelines, 2007).
  
- c) **EVACUATION:** Abandonment mainly relies on the availability of different adequate and appropriate resources, such as, equipment, sufficient competent crew and applicable emergency plan. Analyzing the evacuation processes onboard passenger ships has an increasing interest nowadays. Some of the approaches utilize the so called ‘‘a simplified evacuation analysis and an advanced evacuation analysis’’, which are approved by the IMO to be used as guidelines to assess evacuation for new and existing passenger ships. That are used also for identifying and eliminating, as far as practicable, congestion, which may be developed during abandonment, due to normal movement of passengers and crew along escape routes, and demonstrate that escape arrangements are sufficiently flexible to provide for the possibility that certain escape routes, assembly stations, embarkation stations or survival craft may be unavailable as a result of a casualty (IMO, 2007).

Mainly these ways assess ship's arrangements related to the details of human behavioral data related to: walking speed in corridors, open spaces, rounding corners, climbing and descending stairs, listed ship, pitching and rolling of the ship, as a function of age, in groups or individually (Safer Euroro, 1997, PP70-75).



This requires the maritime safety regulators to give careful considerations to the ship's design and its escape routes, which varies regarding year of built, and the effect of ship's crew on mustering and embarkation of passengers.

## **6. Outline of crew duties related to passengers**

Regulation III/37 of SOLAS74 states many of ship's crew duties related to passengers, such as, warning the passengers, ensuring of wearing lifejackets correctly and suitable clothes, controlling the movements of the passengers and assembling passengers at their muster stations. However, the guideline on evacuation analysis completely ignores the effect of the ship's crew (minimum safe manning) on the evacuation process. Consequently, the effect of crew shortage is overlooked not only in the mustering process but also in embarkation and launching of survival crafts.

## **7. Manning of survival craft**

In abandonment process of a passenger ship, there is a room for everyone in survival crafts, with substantial excess capacity. Most of these survival crafts are in the form of lifeboats, with the remainder consisting of inflatable life rafts stored deflated in container. Mainly, a passenger ship is equipped with survival crafts according to the requirements of SOLAS, Regulation III/21 that requires passenger ships engaged on international voyages or short international voyages to carry a specific number of survival crafts and rescue boats; in addition, the type and number of survival crafts vary from a ship to another even between ships with same capacity relies on many factors, such as: the capacity of each survival craft, type of launching appliances, year of built, the type of a passenger ship e.g. RO- RO, high speed or cruise passenger ship, and the nature of voyage e.g. either international or short international voyage.

Manning of a survival craft is mandatory as per SOLAS74, Reg. III/10 and is a potentially important part to safe manning process and for safe evacuation. Clearly, there are different types of survival crafts that need to be manned in view of its type and launching arrangements as described in Table 2. For example, open type life boats are neither equipped with engine nor on load release mechanism, which allows releasing boat hooks internally, that's why ships fitted with that type of life boats need more crewmembers for safe launching and operation.

**Table 2: Examples of survival craft manning**

<b>Type and characteristics of the survival craft or system</b>	<b>Qualified persons</b>
Lifeboat boarded at the stowed position and capable of being released and lowered internally.	2 per boat
Lifeboat both released and lowered from the vessel	3 per boat
Davit launched life raft	1 per raft plus 1 for each davit
Marine Escape System	4 per system and 1 for each raft associated with the system

**Source: Republic of Vanuatu, Maritime Act, [CAP.131].**

## **8. Conclusion**

In conclusion, crew shortage on board passenger ships is common and widespread. There are clearly serious risks and consequences inherent in allowing passenger ships to be manned accordingly and as per the minimum safe manning documents. That is potentially important and can result in more maritime disasters. Manning levels need to be addressed in a realistic way that prevents financial advantage accumulating to shipowners, who operate with the least applicable number of crewmembers may be assigned on board a ship. Such approach must consider also the minimum training and qualification levels for the minimum number of ship's crew necessary to safely operate a ship. It must address the required number of qualified and experienced seafarers sufficient for safety, security of the ship, and protection of the marine environment including consideration of safe operation and maintenance of all on-board fire-fighting, emergency equipment and life-saving appliances.

## **9. Recommendations**

The existing legislation and guidance on minimum safe manning has not had the significant effect. From a wider point of view, not only manning for watchkeeping capacities, for maintaining safe bridge and engine watches, but also emergencies' purposes should be studied further.

Moreover, the existing IMO guidelines on principles of safe manning, "A 21/Res.890 and A 23/Res.955", should enforced in conjunction with the mandatory provisions SOLAS, III/10, and V/14. That must be supplemented with appropriate guidance regarding passenger ship's aspects e.g. year of built, design, number of passengers and survival crafts' number and capacities.

However all efforts to improve maritime safety are severely diluted if crewing levels are insufficient to carry out all necessary tasks regarding emergencies.

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