

THE ABANDONMENT OF LARGE PASSENGER VESSELS

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Before I start, I want to make clear that this is not a diatribe against the cruise industry. There are well operated ships, and I recognise that there are vessels designed and small enough to enable safe abandonment should the need arise. Unfortunately, not many as there should be and the huge cruise ship continues to dominate the cruise industry.

Those controlling these companies are business people answering to investors and they are responsible to them. Without doubt we are seeing a new kind of business operation with their own values in the marine industry mostly drawn from the entertainment and hotel industries but they have been successful in ensuring the future of the passenger ship sector and of course in providing employment for many of our colleagues. Also being in business, I understand and accept that legislation provides the major stimulant for safe operation of a company. If the legislation says you must do or have it then you do. If it does not, then unless there is a compelling reason, then you don't, and it is this legislation that I wish to address this evening. I would point out however that there does exist the duty of care, which while not being the responsibility of the legislators, does fall within the jurisdiction of the operators and the flag states.

Over the last thirty years, we have seen the development of passenger carrying vessels, both in the cruise sector and in the ferry sector. The ferry sector was once just that, a method of transportation on water of people and

vehicles from one place to another without too many frills. The Cruise sector was based on ship designed for long voyages but used for short cruises during the summer seasons in varying parts of the world.

The Cruising business is now a separate industry, similar to the marine oil and gas industry both now having little commonality to the marine industry as a whole, yet after the major disaster of the Alpha Piper platform in 1978, while the Oil and gas industry, realising that the existing legislation did not ensure sufficient safety, have moved away from the IMO and Flag State, the passenger carrying vessels have remained.

Some statistics;

Annual number of cruise passengers 20,335,000

Average growth of the industry since 1980 7.4%

No of cruise ships currently on order 26

Average age of passengers 50+

No of cruise ships sunk since 1980 55.

THE IMO.

A recent well respected marine commentator has recently described this organisation as bankrupt.

I liken it to a ship that has gone aground on bureaucratic shoals through bad seamanship. It desperately needs salvaging otherwise it will continue to deteriorate but the owners are delaying paying the price of the adequate tugs, instead they are telling the crew to keep plugging the holes.

THE SHIP'S A LIFEBOAT

The latest hole plugging is by Captain Andy Winbow, The organisations Assistant Secretary General. At a presentation to the National Transportation Safety Board in Washington, D.C. he discussed the new International Maritime Authority (IMO) policy of using “the ship as the lifeboat.”

I quote ;

'so we need to think of something new, and that proactive approach led to this idea of the ship as its own lifeboat. '

Captain Winbow, should read his history books. That idea existed with the Titanic and didn't do them much good.

Here are a few more recent examples of the failure of the lifeboat theory .The ship is a lifeboat is dangerous.

The very suggestion of this promotes could lead to other delays in abandoning at the further cost of lives and I am dismayed that a professional seaman and the deputy to the secretary general is promoting such a discredited course of action.

This is not to say that ships could not be much safer, but that will cost money and if the will to do this exists, then why have these improvements not already been implemented? I return to my opening statements. The people heading these companies are there to make money and if they don't have to do it then they will not.

LEGISLATION

That now leads us to what Captain Winbow should be concerning himself with.

. The IMO "Guidelines for a Simplified Evacuation Analysis for New and Existing Passenger Ships" covered by MSC Circ 1033 and its successor MSC Circ 1238 recommend a maximum allowable total passenger ship evacuation time to be in the range of 60 to 80 minutes, the difference in time being for the number of vertical fire zones.

The assessment is based on the following:

5.1 the crew will immediately be at the evacuation duty stations ready to assist the Passengers.

It is my experience that this never occurs, especially at night. As a benchmark, 10 minutes should be allowed for this. A small proportion of the crew will not even appear at their correct stations at all, many being stalled by the need for passenger attention or other immediate duties that only become apparent at the onset of the emergency.

.5.2 passengers follow the signage system and crew instructions (i.e., route selection is not predicted by the analysis);

With emergency lighting, (not considered in the model) and possibly smoke, the signage and routing could be obscured. As the number of passengers grow, the following of the crew routing instructions will slow down.

.5.3 smoke, heat and toxic fire products present in fire effluent are not considered to impact passenger/crew performance.

This is quite a surprising statement. The Department of Health of New York states

' Inhaling smoke for a short time can cause immediate and acute effects. Smoke is irritating to the eyes, nose, and throat, and its odour may be nauseating. Studies have shown that some people exposed to heavy smoke have temporary changes in lung function, which makes breathing more difficult. Inhaling carbon monoxide decreases the body's oxygen supply. This can cause headaches, reduce alertness, and aggravate a heart condition known as angina.'

Smoke will completely hamper evacuation particularly as the cruise ships do not have smoke hoods in the cabins. In the event of a serious fire in the accommodation, how do these companies intend getting the passengers out?

.5.4 family group behaviour is not considered in the analysis.

This is particularly important. Families, if apart, will separate from crew instructions to look for their family members, especially if parents are on the upper decks at the time of the alarms and their children are in their cabins several decks below. Any instructions to deter this will be ignored.

.5.5 ship motion, heel, and trim are not considered.

Again a most important factor. Any rolling of the ship hampers movement, especially amongst those not experienced in movement during rolling. Any list or rolling will particularly hamper the infirm and disabled, especially those in wheelchairs. The question remains as to how these ships intend to move the wheelchair bound passengers down several decks without lifts.

I suggest Force 5 winds with a 3 to 4 meter sea from trough to crest together with a five degree list and a 10 degree roll giving a maximum heel of 15 degrees. These figures could be considered as average for sea conditions.

Finally two other factors have not been considered.

Alcohol

The cruise industry of today relies on a high alcohol consumption for a considerable part of its profits unlike the past where the cabin cost was the main income. This means that the old controls that used to be imposed are now gone with the result that, especially at night, a high proportion of passengers will be intoxicated in varying degrees. Not only the passengers. All the cruise ships have crew bars, therefore it is reasonable to assume that a small proportion of the crew will be under the influence of alcohol as well. This intoxication will considerably hamper the evacuation efforts

Lifejackets

The wearing of lifejackets in the ship has not been considered or commented on. If they are worn they will double the space required for passenger movement, again increasing the evacuation time.

'Currently, these passengers are each issued a large bulky SOLAS approved inherently buoyant lifejacket. Anyone making their way from a cabin to the upper deck for abandonment when the ship is listing or flooding has an impossible task to do this when wearing one of these or trying to drag it behind them along the companion ways, stairwells and stairs'

Markle, R.L. A Study of LifeSaving Systems for Small Passenger Vessels. USCG Study March 29, 1991.

No professional seaman would accept this basis for criteria for abandonment of the modern cruise ship as anything more than farcical.

DESIGN

This Impacts heavily on the evacuation of the ship. As the decks continued to get higher, so did the lifeboats . Eventually they became too high for safe evacuation and they were moved back down to a lower distance above sea level. Unfortunately the deck space for mustering by these boats was not designed into many ships therefore the mustering of passengers is still completed in the public rooms on the upper decks. Then the lifejackets are

put on and they are led down to the boat embarkation deck. This not satisfactory for many reasons. Passengers on the upper decks have to go to their cabins, often below the boat deck and then return to the upper decks for muster. At the same time passengers are coming from their cabins and going up to the upper decks to have to go back down again to the embarkation deck. Give the situation of night time and emergency lighting , it is very easy for passengers to get mixed up and indeed lost from their group. I doubt very much if all passengers will be at the correct boats leading to a panic enhancing situation trying to find space in other boats.

Further, how the cruise ship companies intend to move the hundreds of infirm and disabled passengers from their cabins to the muster station and then down to the boats, especially when the lifts have been disabled and there is a list on the ship, has not yet been explained. If it is by appointing crew to assist them, then the passengers will have to be tagged in order that the appointed crew know their whereabouts at all times, and those crew not assigned any other duties during an emergency except the care of their passenger.

The design of these ships, with so many passengers must be such that there is space for them to muster by their boats. The space should contain seating for passengers to wait for the embarkation order. This will allow mustering to be ordered as a precaution and avoid panic. The lifejackets can then be stowed there, although what must be considered is the wisdom of wearing lifejackets in enclosed lifeboats .

Stairways.

The main criteria for the design of stairways on these ships seems to be aesthetic rather than practical. The stairways should be so designed to avoid blockage which if occurring, would lead to delays and the inevitable start of panic conditions. It is therefore essential that they are wide enough to allow for the movement of dense two way traffic with systems that allow for the emergency movement of wheelchairs.

Double Hulls

As these ships become larger, with more lives at risk, it becomes common sense to require double hulls. Such hulls are already required on tankers to

protect the environment so surely double hulls should be required to protect lives?

For cruise ships going into ice waters, regardless of the time of year, there is still a danger from growlers and Bergy Bits. Bergy Bits with exposed areas of 3 meters or over above the surface can be detected at a distance of 3 miles in calm waters, but this is considerably reduced by weather. Growlers are smaller bergy bits with their area above the surface melted down to less than 1 meter above the surface and with areas of around 20 sq. meters. Anyone who knows ice conditions knows that these can slice through steel like a knife through paper.

'Growlers are very difficult to detect visually, may not show up visually and are, consequently, very dangerous.'

The Ice Navigation Manual. House, Lloyd, Toomey and Dickens.

Cruise ship venturing into waters where these are possible should be required to have double hulls. If not, then they should be prohibited from going into such waters, even if carrying an ice pilot as such a pilot is no different than anyone else in spotting these growlers.

LIFESAVING EQUIPMENT.

The Lifejacket.

The SOLAS specification for lifejackets are inadequate for all shipping regardless of type, however for those unfamiliar with the sea and safety, it is essential that the standard of lifejackets required for these ships be upgraded for the following reasons;

The standard lifejacket can injure the wearer by rising up and possibly breaking the neck. The SOLAS lifejacket has changed little from the Titanic incident when many bodies were found with broken necks. Crotch straps, which would prevent this from happening, are not required.

In fact SOLAS recommendations state that no one should jump into the water with these on from a height more than 4.5 metres!

As most of the open deck space on the cruise ships is now above this height, why are not passengers instructed about this and why are there not notices posted on those decks above this height warning of the dangers? I would suggest that there are Masters of cruise ships that did not know of this recommendation.

There is no hood to prevent heat loss through the head or face mask to keep the or-nasal cavities clear.

The term life jacket is a misnomer as they are not jackets and do not give any warmth protection to the body.

The bulkiness of these jackets double the space required during evacuation and mustering.

The need to change the lifejacket requirements is particularly important for cruise ships going into cold waters.

*'Anyone who has spent any time in open water with any wave splash and wind understands the huge improvement in performance with the addition of a face shield and crotch strap
All who attended the expert meeting were in favour of strongly promoting face shields and crotch strap'*

The conference on drowning in Amsterdam in June 2002.

Lifeboats

According to the LSA code 2010, the lifeboats, which are allowed to carry up to 150 persons will be boarded in 10 minutes. Which is 15 per minute or if you like, a passenger every 4 seconds. This is impossible, especially with enclosed lifeboats which are boarded through narrow openings.

We must also question whether 150 persons can get into lifeboats approved for this number. The space and weight allocation defined in the 2003 IMO Life Saving Appliance (LSA) Code [27] are too low. The 430 mm buttock width and 75 kg average weight were established many years ago, before people started to grow taller and expand their girth. For many years now, most survival training schools have realized that it has not been possible to load

any of the lifeboats to full capacity, even when the students were just wearing work coveralls and no lifejackets.

*'In 2005, a typical maritime offshore oil training class of 41 people was measured in Dartmouth, Nova Scotia (39 male, 3 female). Their ages ranged from 18 – 56 years. Over 70% of the group measured in **work clothes only** exceeded the 430 mm space allocation at the hips, and the shoulders were even wider. The average weight was 87 kg, 12 kg over the IMO specification.'*

A human factors study on the compatibility between human anthropometry, ship abandonment suits and the fit in a representative sample of lifeboats – A preliminary report on 41 subjects. Proceeding of the 4th International Congress on Maritime Technological Innovations and Research, Barcelona, Spain, 95-102.

Brooks, C., Kozey, J., Dewey, S. and Howard, K. (2005).

No lifeboat is currently designed for disabled persons yet ashore whole cities are being adapted.

Lifeboats can still only be provided for 75% of the persons on board. This places the cruise ships in the same position of the Titanic. To put this in perspective, with a ship having 8000 persons on board, 2000 will have to rely on liferafts.

Life-rafts

Life-rafts have been a large step forward in saving life at sea however to rely on life-rafts as lifeboat replacement is wrong and unsafe. Such an interpretation is not placed on conventional merchant ships where the lifeboat capacity is required for ALL on board so why is this allowed on cruise ships where there are far more persons and many totally untrained or familiar with the sea?

The capacity of liferafts is the same as that for lifeboats

'the number of persons having an average mass of 75 kilogrammes, all wearing either immersion suits and lifejackets or, in the case of davit-launched liferafts, that can be seated with sufficient comfort and headroom without interfering with the operation of any of the liferaft's equipment.'

As previously stated, the average weight was proven to be 87 Kg without any extra weight. If the weight of immersion suits, wet clothing and lifejackets, I suggest that a conservative figure can be assumed to be at least 90Kg which means that the capacity is now reduced by one fifth of that stated. Thus a 25 person liferaft is now only capable of holding 20 persons and a 60 person liferaft only capable of holding 48 persons.

Life-rafts have been proven to be difficult if not impossible to board in certain conditions.

In strong winds they can blow away, elderly, infirm, disabled, children and injured persons will find them difficult to board even in good weather.

“A patrolling C-130 happened to be in the area and dropped life rafts and we made some effort to get into the life rafts, but we couldn’t. The rafts are almost impossible to board, especially if you are in a weakened state.”

Seward Phoenix Log, August 21, 1997

By Roger Kane

Sail S Sank in Bering Sea (Tug)

The life-rafts have to be boarded when they are in the water which means that the passengers have to rely on their lifejackets.

Trinity 11

“Inflating the life raft on deck — instead of throwing the canister containing the life raft into the water, which was the proper method and was clearly illustrated in the launching instructions posted where the life rafts were stowed — caused the life raft to blow away from the deck in the hurricane-force winds and vanish in the rough seas,”

Trinity 11 inquiry, NTSB

Boarding a liferaft with a standard SOLAS lifejacket on is very difficult.

Total Lifeboat and Liferaft Capacity

Based on the IMO design weight requirement for lifeboats of 75 kg If we conservatively assume that those persons in the lifeboats wear only light clothing and thus using the Dartmouth trial weight of 87 kg and that those in the liferafts are more protected and weigh an average of 90 kg we have a situation where on a 4000 person ship, out of the 3000 persons in lifeboats there will be no room for approximately 300 persons assigned there and on the liferafts, no room for 100.

Where are these 400 persons to go?

Smoke Hoods

Presently these are not required on cruise ships.

'Victoria relayed this information to my father and they began to get dressed so they could escape their room. As they dressed, thick black toxic smoke began to fill the corridors and began to seep under the doorway of their cabin. After dressing, they grabbed towels and began to wet them so that they could be used to aid them in safely escaping the fire.

Once they opened their cabin door they were unable to see due to the thick black smoke. They then got down on their hands and knees with the wet towels wrapped around their faces for protection and began to crawl towards the nearest exit. They remembered an exit being located close to their cabin and began crawling in that direction. Once they reached the exit, they could see flames coming from the other side of the door and knew it was not safe to exit at that location.

The corridor continued to fill with smoke and their visibility was zero. There was no emergency lighting to aid them or any emergency response team to assist them. Victoria held on to the back of my father's T-shirt as he attempted to lead them through the corridor to safety.'

Statement from Princess Cruise ship passenger

I suggest that this statement makes the case for smoke hoods to be placed in every cabin.

CONCLUSIONS

I don't think that there are many who feel that the IMO is 'fit for purpose'. Certainly amongst those at sea there is a feeling of disenfranchisement and this is from an organisation whose main function is the safety of those very people.

While the IMO must accept their part in the deterioration of standards at sea in general, the flag states must also accept their proportion. All these countries have signed into UNCLOS which categorically states that those signatories yet how can flag states that sell their registrations like postage stamps take any responsibility?

The IMO must consider the implications of their propagation of the 'ship is a lifeboat' theory. Certainly the present 'hotel' ships cannot be considered that. I do not discount the possibility of designing ships that have a far better chance of this than the present generation but considering the reluctance of many of these companies to even place adequate lifejackets on board, I have a feeling that it will be a long time before we see the changes in design and management attitude required. In the meantime, all ships must be prepared for abandonment and there should be no delay in passengers being mustered by their assigned boats and even being ordered into them to await the final decision. Discomfort is far preferable to a worse alternative.

The cruise industry has based its abandonment criteria on the model presented by the IMO and it is deeply flawed. I suggest that the factors I have shown will at least double the evacuation time, if not more, which would mean that none of the existing hotel ships can pass the time criteria.

the Criteria for evacuation must be based on worse case scenario rather than the present best case and abandonment be made taking into account all factors of weather, heel and list, darkness, distance from the muster point to the boat embarkation position, number of elderly, infirm and handicapped persons on board, possible fire and smoke and estimated number of intoxicated persons on board.

As all crew members will be involved in any abandonment which could be at any time, it surely is essential that a strict no alcohol policy for all crew members be enforced.

The ships should be designed to ensure that the muster stations are by the boats with ample space for assembly and even sitting arrangements for passengers to await any embarkation order. Each boat muster station should

supplied with a first aid pack and a defibrillator. Having such a place to await abandonment would assist in removing a considerable amount of the probable panic situation from the abandonment equation.

That the muster station be where passengers are supplied with their lifejackets. At the same time, lifejackets be also stored in the public rooms in case of inability to use the muster points.

There should also be a study as to why passengers should embark enclosed lifeboats wearing lifejackets. If anything did go wrong, very few of them would be able to evacuate the lifeboat.

Cruise ships should be required to adopt double hulls exactly the same as the oil and chemical carriers, especially those going into ice waters.

That the lifeboat and liferaft spaces be re-evaluated in line with the study carried out at Dartmouth and that the boats be re-assessed for the number of passengers to be carried under the new space findings.

That cruise ships should carry sufficient lifeboats for ALL on board.

That a number of lifeboats specifically designed for disabled passengers be carried. That the cabins for disabled passengers be required to be on the same or next to the embarkation deck. Until this can be applied that there be a limitation on the number of disabled passengers carried, especially those in wheelchairs.

That the consumption of alcohol be better controlled. That the age limitation be strictly enforced and that a policy of confinement for inebriated passengers be adopted for their safety and that of others on board.

That all lifejackets be replaced for a type that incorporates a hood, face mask and crotch strap.

That notices be placed on all open upper decks above 4.5 meters stating that it is dangerous to jump from these decks with lifejackets on.

That the procedure for jumping into the water with lifejackets on be stated and demonstrated at the muster and a notice be in each cabin.

That passengers are advised of the warm clothing requirement before joining and that the warning of this clothing at the muster be strictly enforced.

That either all external lighting except for the navigation lights be extinguished and windows curtained, or that the navigation lights fitted be increased in size and brightness.

That on cruises of over two weeks duration, every two weeks, all passengers be mustered at their muster point and that all lifeboats are placed in the embarkation position. That the initial muster include the passengers being conducted from the muster point to their lifeboat.

That the uniforms on board reflect the command responsibility and that the executive and engineer officers can be well defined from the hotel staff. That the hotel staff wear clothing and rank/rating markings that cannot be confused with the traditional seamen officers of the ship who will be giving the command orders during any emergency.

That sufficient seamen are employed to enable each lifeboat to carry 3 and each liferaft have 1. These should not be hotel or entertainment staff.

It might seem that all this is asking too much but as the prime consideration of seamen is the safety of those on board, our function as seamen professionals is to consider all the problems and deal with them before the event rather than the reactive approach currently used. We rely on the IMO and SOLAS regulation for leadership but when that doesn't happen, are we to stand back and wait for the next accident and then the next?

This is exactly what we are doing and each time we point our finger at SOLAS and say, 'The equipment conformed,' 'The design conformed' or 'The ship was manned according to the safe manning certificate,' as if that can exonerate us from responsibility for those injured or killed. We have a professional voice and I suggest if we used this more often, it would be to the benefit of all those at sea.

As seamen, we are used to the failures of the Imo and sailing with badly designed ships and safety equipment. But things had changed drastically and we have reached a critical time in our place on the seas. We now have over twenty million passengers with no knowledge of safety at sea sailing on these ships. As the profession directly concerned with safety I believe that it is essential that we instigate a public inquiry into the situation. In this country while our fleet continues to shrink our expertise is still here and far greater than in the IMO. I recognise that we are using this expertise on

**various committees to advise the IMO but what is happening to that advise?
It goes in one and if it comes out at all, it is completely changed and too often
what comes out floats.**

**If the Nautical Institute, Nautilus, the Honourable Company of Master
Mariners and Trinity House between us decided to act we would have a most
professional inquiry into the situation that would only benefit those who sail
on these ships and ultimately prove of benefit to those who manage them.**

**The Costa Concordia was the wake up call to this industry and this
profession. If we ignore that call, then we do it not just at our peril, but at the
peril of those who will be caught up in the next disaster.**

55 cruise ships sunk since 1980. Do you think it will stop now?