

# Dangerous lifeboats

## A race to oblivion?

**Captain Dennis Barber FNI**  
Marico Marine, UK

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*Possibly because he was sickened by the ongoing waste of seafarers' lives in accident after accident associated with lifeboats, Rear Admiral John Lang FNI, when he was still Chief Inspector of Marine Accidents at the MAIB, made what was taken by many to be an outrageous suggestion.*

*He questioned the wisdom of continuing to launch lifeboats for exercise purposes.*

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Several years on, the accidents keep coming. IMO deliberates and tinkers with the requirements of Solas and now fewer seafarers are exposed to such possible accidental mishaps when exercising lifeboats. The lifeboats, however, are still required to be lowered into the water with crew aboard. The boats and their launching apparatus remain unchanged. Presumably the theory behind the current thinking is to reduce the casualties by reducing the numbers exposed to danger. In the strictest mathematical sense this could be called risk mitigation. Moves to eliminate the real causes however appear limited.

In an article I wrote for *Seaways* in April 2005, in which I suggested that a proper risk assessment had not been done, I questioned the wisdom of the design which permitted a personnel carrying device – the lifeboat – to be exposed to uncontrolled lowering protected only by a single point of failure, the falls. If one of them fails the boat does not possess powers of levitation and the result is usually a failure of the other end of the boat. It is not designed to take loads longitudinally. The question was raised as to what happens if any part of the suspension system fails, concluding that in designs permitted or – perhaps more accurately – prescribed by Solas, the result would be gravity induced catastrophe. The words were not quite those but the sentiment remains the same.

Just over a year on, I remain unconvinced that any lessons have been learnt. Examining the subject more closely it seems countless risks are being taken by ships' crews to satisfy regulatory surveyors who insist that the only way of proving the effectiveness of the survival craft is to test them by lowering. Inconsistencies abound, however. The only survival craft to which this dogmatic approach is applied are side-launched lifeboats. Liferrafts are never launched except in controlled and frequently heated pools during training – that apparently is acceptable. So-called 'free-fall' lifeboats are launched only when commerce and harbour authorities permit and then very infrequently. That also is acceptable. If seafarers are unfortunate enough to be on a vessel with side-launched lifeboats, they are expected to risk their lives every three months, if they happen to be the appointed boat's crew. Strong words, you may think, but examine the statistics of accidents during boat launching exercises and unacceptable statistics begin to emerge.

### Coping with stress

As an inspector of ships, both for commercial and flag state purposes, I see the varying ways in which masters cope with the stress of exposing their crews in this way. What I notice is that on more traditional vessels with open lifeboats, the crews are usually efficient and confident and can get a boat in the water and away

within minutes. On the newer vessels with totally enclosed boats, on-load release gear and remote lowering, the reverse is true. Masters will often provide plausible excuses as to why they have not done the exercise, citing restrictions in ports by harbour masters as the most commonly encountered reason. Presumably any guilt they may feel at the omission is purged by the excuse. What I suspect however, (having been in their shoes myself), is that they do not believe there is any real merit in the exercise. The risks outweigh the benefits. They would rather take a chance on never having to launch a boat in anger, than face the prospect of having to explain their reasons for exposing the crew to such danger in the face of awkward questions at the inevitable inquiry. And an inquiry may be expected after an accidental lowering or a cataclysmic fall resulting almost certainly in serious injuries or fatalities. The inquiry is almost certainly perceived, not without good reason, as a means of looking for somebody to blame. The masters do not want to be in the frame when that happens. I believe however that the vast majority of masters are genuinely concerned for the safety of their crews, long before they consider their own reputation.

So to return to the opening theme; was the outrageous suggestion of Admiral Lang really so outrageous? I for one do not think so. In fact as a result of being deeply involved in the studies that went with the formal safety assessment (FSA) of bulk carriers at IMO, I am convinced that the real problem has never been fully tackled at source since the opening of the lifeboat debate in the aftermath of the *Titanic* disaster. The insufficient number of lifeboats took precedence in the minds of regulators over the challenge of launching them.

The problem of evacuating a ship appears to have been misunderstood by those responsible for the design of the craft intended for that purpose. The nature of the challenge has never been effectively analysed.

## When to get off?

When a ship is sinking, has the question been asked – when is the best time to get off? Many believe that the ship remains the best lifeboat until it no longer exists. I agree with them. The apparent preoccupation of regulators and designers with abandonment is not only illogical but dangerous. Which way does a ship sink? Like any other body on the earth's surface it obeys the laws of gravity and when the opposition to gravity provided by the ship's buoyancy ceases the hull plunges towards the centre of the earth, stopping only when it reaches the seabed.

So why, when it is concluded that we must leave this vessel before it leaves us, do we get into a craft tenuously suspended on either side of the vessel on wires beneath a pair of davits and then proceed to try and overtake the vessel on the way down? The same craft has been designed to be so buoyant that it is almost impossible to sink. We now choose to tether it to the vessel by closed hooks that have a complex release mechanism. The mechanism can only be operated after a complicated sequence of counter-checks have been performed, either automatically, usually by a hydrostatically activated interlock. Failing that, the crew can operate a manual override whose presence in the boat fills the occupants with dread that it might be prematurely released.

The davits that are used for such launching are useless at more than a very shallow angle of trim and yet all the evidence of vessels sinking suggests that

the ships, as they lose buoyancy in the main body of the hull, turn towards the vertical (usually) stern end uppermost where the remnants of buoyancy reside. When the bulkhead to the after spaces fails, the hull plunges vertically beneath the waves.

Depictions in paintings of ships sinking always emphasise this characteristic, simply because the witnesses to the event have always described the event thus. In more modern times, photography has reinforced the fact. Even ships such as *Erika* and *Prestige*, both tankers, carrying cargoes that are actually buoyant, have finally sunk in this way.

It is accepted that there are differing requirements for different evacuation scenarios. Tankers, which are more likely than most vessels to become uninhabitable because of fire, need a rapid, fireproof form of escape and the free-fall fireproof lifeboat makes sense (although I am intrigued to know what is the reasoning behind fitting such boats on vessels regularly trading in ice). The totally enclosed nature of boats on tankers also makes sense when combined with an external sprinkler system and breathable air reservoirs inside. But on all other types of vessel, is total enclosure such a good idea? Granted it provides good protection against exposure but it also prevents a seafarer from exercising his/her skills – a factor made more evident to me when witnessing the differences between launching open and enclosed boats.

## Free-fall, float-free

The Formal Safety Assessment (FSA) study of bulk carriers at IMO identified free-fall boats as a good idea on rapidly sinking types of vessel such as heavily laden bulk carriers. I also note that small single-hold cargo vessels have the same problem with rapid loss of buoyancy. They should be treated in the same way as bulk carriers. A proviso was added in the IMO findings that the boats should also be float-free; a feature that I fear is too easily lost in the habitually used designation of 'free-fall' boats.

The requirement is one that, for some curious reason gives the design community a problem. When directed by IMO's Maritime Safety Committee to investigate the feasibility of float-free operation of free-fall boats, the Design and Equipment Sub-committee quickly concluded that the technology was not yet available to make the proviso a reality. There the initiative appears to have stopped. What is this technology whose discovery is awaited? I

believe Archimedes actually discovered it around 200 BC. Most boats I view are certainly provided with plenty of it and would float free if permitted to do so.

Most 'free-fall' boats would float free if not launched in the designed mode, provided the limited holding-down arrangements were removed. If restraining arrangements were sensibly designed and positioned so as to be easily accessible the boats would almost certainly float free. A senhouse slip by the door of the boat, so that it is unlikely to get overlooked, would, for example, be one answer, especially if to open the door it was necessary to release the slip. Surely this is not rocket science? The missing 'technology' already exists and has been designed into lifeboats with a vengeance – it is called 'buoyancy'.

Even side-launched lifeboats will float free, if permitted to do so. Witness the picture of *Erika* sinking in which the unused lifeboat floats free as the ship sinks vertically below the waves. The reader will no doubt note that the boat is of the old, open untethered type that was fitted with open hooks.

The Royal National Lifeboat Institution, surely one of the most competent authorities on the subject of launching lifeboats, which incidentally are now much larger than most that can be found aboard ship, chooses to launch boats using a float-free method when they are rolled into the sea on a trolley (see pictures; p 24).

I believe that even existing boats could be made to float free by modifying the stowage arrangements. The boats should be supported in cradles, removing the falls and securing them against the davit arms with large wrap-around cushions to act as fenders (Figure 1, p24). This would give crews maximum time to get aboard the boat, releasing gripes as they boarded, securing seat belts once inside. They would then be in a safe cocoon that, when the ship plunged downwards, would be free to float upwards and clear. Certainly this would not be the most comfortable of rides – but would the complainer like to suggest another method, bearing in mind that staying aboard is not an option?

The boats could still be launched in highly controlled environments such as still water harbours for exercise purposes: see Figure 1.

From experience, I note that the conventional descent on falls can often be one of wild oscillations, sometimes accompanied by alarming impacts with the side of the vessel. The bouncy ride down (davits spring significantly) can then possibly be terminated with a partial or



▲ *Erika*: Note 'float-free' boat



▲ *Prestige*



▲ RNLI uses a float-free method

complete capsize as the boat contacts the water while at the same time swinging extensively like a pendulum. This occurs in response to even the slightest of rolling movements by the ship if not alongside a dock wall. It can hardly be described as a comfortable ride.

## Single bipod

In future, two-fall suspension could be replaced by single bipod slinging beneath a crane on each side of the ship. The same cranes could also serve the stores and gangway rigging aft. These essential operational requirements are all too often ignored by designers. Boats should be re-designated to match other passenger carrying lifting gear such as lifts (elevators) and should incorporate the same safety precautions. This might require a second back-up suspension system from the crane or more realistically, occupants should board at the water's edge. A method of marrying up embarkation ladders or similar with boats should be found. It is a challenge but not impossible. It is frequently done for liberty boats.

Davits may be seen as an unnecessary expense. They, together with other elements of the suspension systems, have proved to be unreliable and even dangerous, even in the sheltered conditions of a port, let alone the constantly moving environment of the open sea. So why not take the advice of Admiral Lang seriously and accept that it is not necessary to continue pedantically exposing seafarers to the dangers of

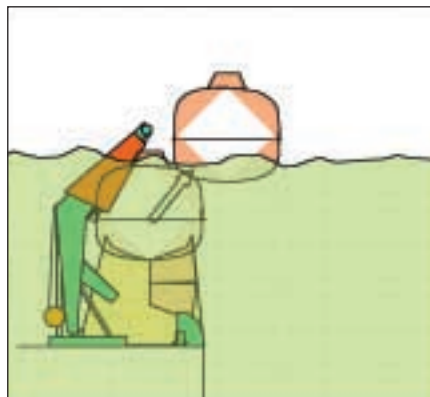
launching, just because they are unfortunate enough to be sailing on a ship that is equipped with side-launched lifeboats. This conclusion has already been reached with liferafts and to a more limited extent, free-fall boats as well.

## Up or down?

An analogy from aviation may help us concentrate on the essential issues. Does a fighter pilot regularly use his ejection seat to exercise? Moreover, if he does use it when the aircraft is going 'down', the direction of his escape is upward. A well thought-out risk assessment presumably concluded that this was the only way to go.

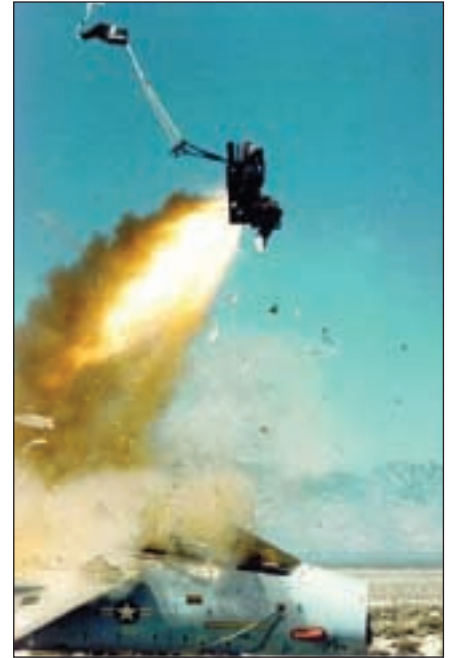
On ships however, the same logic does not appear to have been applied. The seaman it seems, must endure a race to oblivion in the hope that he will reach the water and be able to release his craft from its constraints before the ship sinks. To see how valid that approach is, we should examine the known facts of bulk carrier (and small coasting vessels) sinkings where no distress is sent. It was concluded in the bulk carriers FSA that this was because there was insufficient time to do so. In reality, most of the seafarers probably died in their beds. All the more reason one might conclude for float-off accommodation modules (foams: see *The Naval Architect* February 2003 [www.rina.org.uk/rfiles/navalarchitect/float\\_feb03.pdf](http://www.rina.org.uk/rfiles/navalarchitect/float_feb03.pdf)). Time and space preclude a full description here.

This article is not intended to be cynical



▲ Figure 1: The figure depicts one suggestion for making existing side-launched lifeboats 'float-free'. The boat has additional support beneath in the form of a cradle. The cradle has a fold down flap in its outboard sections to enable conventional launching from falls and davits but in normal seagoing condition the flap would be in position and the boat would be completely supported in the cradle. The cradle would be constructed so as to continue to support the boat in steep fore-and-aft inclinations.

The falls have been disconnected and are held in against the davits within substantial wrap-around cushions that would act as fenders should the boat be required to float free as shown.



▲ US Air Force. 'A well thought-out risk assessment presumably concluded that this is the way to go.'

or offensive. It is intended to challenge in an environment where change is constantly resisted, despite seafarers continuing to lose their lives. How many more lives will be lost before every aspect of the problem is analysed properly. Please let's not use that as an excuse to do nothing while we continue to talk about it. And please let's not commission another research project with terms of reference that are so tight that all vestige of realism is lost. What is needed is the broadest possible look at the problem. Any further research, if any is needed, should be done in the real, full scale domain; not a laboratory, a testing tank or an enclosed dock where the water is glass-smooth.

At a time when prescriptive legislation is generally seen as having failed, what better way is there to start the 'goal based' approach than to deal with life saving by going back to the basics. If the ship is no more, how is it possible to get off and survive? We have to be courageous and admit that we have not yet got it right. Indeed we may have made matters worse by turning the problem over to design studies that look as though they are by scientists who have never been to sea, or who have never consulted mariners.

It is disturbing to consider that the enclosed side-launched lifeboat appears to have killed more seafarers than it has saved. A statistic that, if true, is intolerable. Is the lifeboat still worthy of the designation, 'life' boat?