The lifeboat imbroglio

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Imbroglio? The word would appear appropriate for the lifeboat issue. It comes from the Italian imbrogliare, meaning to tangle, confuse. In English, it can mean 'an intricate and confusing situation'. This is often the case of lifeboat release mechanisms and/or their operating instructions. 'Imbroglio' may also be used to describe 'a confused heap or tangle' - often all that is left after a lifeboat plunges, uncontrolled, many tens of metres into the water.

Year after year since the early 1990s, with alarming regularity, lifeboat accidents have occurred and are the subject of reports and articles – this is one of the latest in a black series. One important example appeared in 2005, Captain Dennis Barber's article featured in *Seaways,* which underlined the primary importance of first eliminating the greatest hazard, that of the lifeboat falling, by the use of 'hanging-off arrangements'.

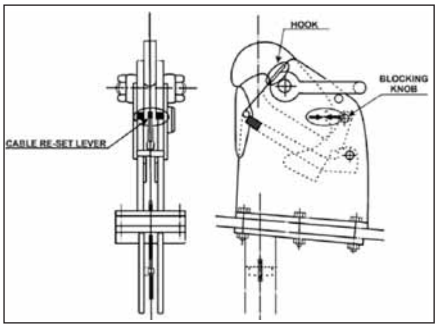
Since the 1990s one complaint often heard and apparently supported by statistics is that many more people have been killed or injured during lifeboat drills than saved by them in an emergency. The last few decades could be said to have seen these lifesaving appliances metamorphose from lifeboats to death-boats. But let us step back for a moment and examine the sequence of events that has brought so much misfortune to the marine community.

'On board *Alexander L Kielland* there were seven covered lifeboats, each with seats for 50 men. Four of the lifeboats were lowered without particular problems. On the other hand, problems occurred with the release of the lifeboat hooks. The hooks which were equipped with simultaneous release cannot be released as long as they are under load and this was difficult due to the rough sea on the day of the accident. For this reason three of the boats were blown against the platform and crashed. On the fourth boat the after part of the wheelhouse was crashed. Through the opening caused by the crash a man managed to release the after hook by hand. Before that someone had succeeded in one way or another to release the forward hook. A fifth boat came down on the water bottom-up when the platform capsized. The hooks had been released in some way or another.'

So read the Norwegian report on the evacuation attempts subsequent to the toppling of the semi-submersible 'flotel' *Alexander L Kielland* in 1980. There were 212 persons aboard, 123 of whom perished. High winds and waves did not help matters, but neither did the fact that the lifeboats could not be released 'on-load'. This singular tragedy, and the resulting regulatory reaction six years later, put in motion a sequence of events that would have a reverberating effect on lifeboat safety for the following 20 years and more.

Primarily in reaction to the *Kielland* disaster, new IMO requirements stipulated that ships built after 1 July 1986 should be fitted with a hook disengaging gear capable of being operated both off and on-load. Of course, no one wanted the lifeboats to be released inadvertently and vague wording was used in Solas that 'adequate protection' was required to prevent accidental or premature boat release. The race was on and manufacturers devised a variety of different solutions to this rather poorly worded requirement.

Within a short time, lifeboat accidents began to occur with unwelcome regularity but a critical mass of statistics was not yet available. By 1994, the situation was serious enough for the Oil Companies International Marine Forum (OCIMF) to



▲ Figure 1: An intricate and confusing situation Diagram from Transportation Safety Board of Canada report M00W0265 - *Pacmonarch*

▲ Figure 2: A confused heap or tangle photo from Australian Transport Safety Bureau report 208 – *Lowlands Grace*

▲ Figure 3: *Alexander L Kelland*
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conduct a survey into lifeboat accidents among their membership. The survey revealed some rather startling statistics – a clear majority of the accidents occurred due to equipment failure or design faults. Of the component failures, a majority were related to the hook/release gear as seen below;

Lack of confidence

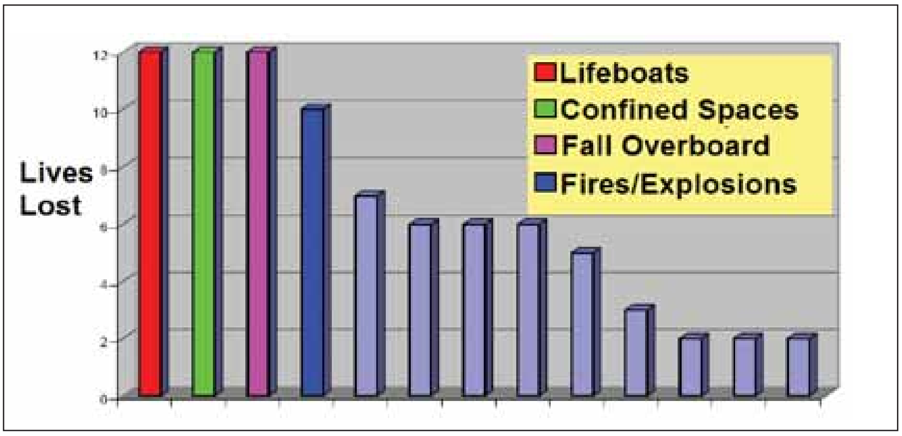
The OCIMF survey also showed a general lack of confidence by seafarers in the hook/release gear. One of the recommendations of this survey was to 'consider installing a manually operated wire spanning the hooks to prevent the boat from falling if the hook releases inadvertently. This wire should be used only during drills and be capable of being released under load.'

In 1996, 10 years after the initial coming into force of the on-load requirement, Solas was again amended and 'adequate protection' became 'special mechanical protection' to prevent accidental or premature release of the boat. This in turn spawned a generation of on-load release mechanisms that incorporated mechanical or hydrostatic interlocks, albeit with manual override. The seeds of complexity had been sown. Lifeboat accidents continued and even appeared to worsen.

By the year 2000, as metioned in Harry Gale's article on the previous pages, another survey on lifeboat safety was conducted jointly by OCIMF, SIGTTO and Intertanko. Many of the recommendations from this survey simply reiterated those of the first OCIMF survey six years earlier.

The UK MAIB Safety Study of 2001 on lifeboat and launching systems' accidents added further weight to the existing body of knowledge; something was terribly wrong with the safety of lifeboats. This report studied U.K. statistics between 1989 and 1999. Accident statistics for this period show lifeboats and their launching systems cost the lives of 12 professional seafarers, or 16 per cent of the total lives lost on merchant ships within the the UK database. Eighty-seven people were injured. These accidents all occurred during training exercises or testing, with experienced and qualified seafarers performing, or supervising, the operations.

This same study found that the root cause of many of the accidents was the over-complicated design of the lifeboat launch system and its component parts, which in turn required extensive training to operate. It identified that training, repair and maintenance procedures fell short of what was necessary, and that there were extensive problems with manufacture, construction, maintenance and operation.



▲ Table 2: Causes of accidents NB Source to be added

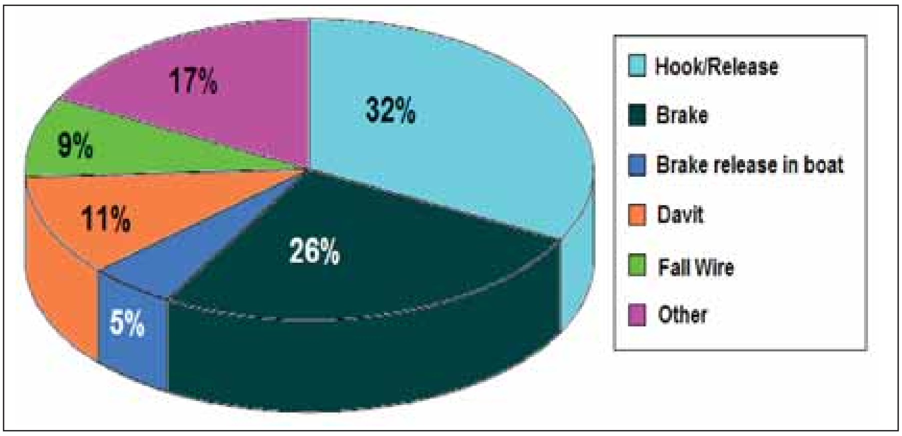
Design problems

In 2006, the MCA commissioned Research Project 555, Development of Lifeboat Design (see also p 5–6). This detailed and valuable report was intended to identify design improvements contributing to the prevention of accidents with lifeboats. However, serious shortfalls in manufacturers' cooperation for this report were noted by the authors. From an ethical standpoint, the lack of cooperation cannot be condoned but from a business point of view it would seem only natural, as patents and market share were in the balance.

From discussions with end users, the report notes that the variability between different designs and mechanism for release is problematic. The report states: 'Standardisation in this respect, irrespective of manufacturer, could therefore be beneficial.' Contrast this with the aviation industry where designs are more generic and manufacturers are absolutely proactive in finding solutions subsequent to accidents. The study also notes that 'many existing on-load release hooks, while satisfying the current regulations, may be inherently unsafe and therefore not fit for purpose.' This is due in great part to the intrinsic instability of the hook design such that '...they have a tendency to open under the effect of the lifeboat's own weight and need to be held closed by the operating mechanism. As a result, there is no defence against defects or faults in the operating mechanism, or errors by the crew, or incorrect resetting of the hook after being released.'

The MCA 555 report also lists many suggested design requirements in respect of on-load release hooks and lifeboat launching systems that would reduce risks, not the least of which is an inherently stable hook such that '...all foreseeable mechanical faults or human errors leave the hook in a closed (and therefore safe) condition.' But hidden within the many pages of the report is an interesting aside. This reads: 'In the longer term for new ships, more radical design approaches may be feasible, superseding methods rooted in antiquity. These might take the form of modern mechanical handling solutions for transferring a safe habitat between the ship and the sea.' This gem seems particularly well stated as we are, after all, in the 21st century. Should crews still be expected to tug and pull on bowsing gear and fiddle with tricing pendants as they did 100 years ago?

On 18 October 2007 a conference on lifeboat hooks and accidents was held, sponsored by Gard P&I. It was well attended by regulators, classification societies, P&I Clubs and manufacturers as well as a senior representative of IMO. It would appear that a critical mass of all the needed players was finally assembling for change. Yet, although there now appears to be a building consensus that more must be done, and despite efforts at IMO, by coastal states investigating these accidents and, ostensibly, by the marine community as a whole to stop or reduce



▲ Table 1: Component failure

these accidents, they continue to persist.

Since publication of the MAIB 2001 lifeboat safety study, some of the lifeboat accidents that have been documented are as follows;

- Seven by the MAIB;
- Two by the TSB (Canada) in 2002 and 2006 respectively;
- One by the BSU (Germany) in 2006;
- Three by the ATSB (Australia) in 2002, 2003 and 2004 respectively;
- Two by the Hong Kong Marine Department in 2003 and 2006 respectively;
- Two by Gard P&I in 2007; and
- One on the MSC India in 2008.

Going forward

Although not without debate, the overall appraisal of the lifeboat situation and the attending root causes can be said to reside within the three parameters of design, training and maintenance. Of course, a bad design can foster training and maintenance problems of its own. A complicated design and training becomes too onerous or even impossible, given the rotating crews and competency levels. Too intricate an arrangement based on high engineering tolerances and less than adequate materials means maintenance, under real world conditions, will probably be less than adequate for the design.

In the short and medium term, seafarers are still at risk of a serious lifeboat accident. As such, both from an ethical standpoint and from the letter of the ISM Code, companies should establish safeguards against all identified risks. The following actions or measures will help reduce risks:

For training and awareness.

- Check the clarity of user's manuals;
- Ensure there is a copy of the user's manual in the language of the crew;
- Ensure shipboard procedures are concise and correct;
- Consider videos and working models of the hook release mechanism.

For operations.

- Survey release gear in use to determine if it is of inherently unstable design;
- A risk assessment should be done on the specific gear found on each ship. The risk assessment should include design as well as maintenance aspects;
- Depending on the results of the risk assessment, various risk reduction measures could be adopted such as 'hanging-off' pennants or having no personnel in the boat while raising or lowering;
- If necessary and when convenient, retrofit the old hook with an inherently stable hook design (in consultation with the manufacturer).

For maintenance.

- Use accredited maintenance technicians on lifeboat gear;
- Do not skimp with costs to these items;
- Chose corrosion resistant materials over less noble ones.

New amendments to Solas (1 July, 2006) no longer require the crew to be on board during launching. This is certainly wise advice especially if no other risk reduction measures are taken – such as maintenance (hanging-off) pendants that 'double-up' the fall wires until the boat is waterborne. But care must be taken not to substitute one risk for another; for example, descending into a waterborne boat by ladder from great heights is an inherently risky operation.

What is to be learnt from the sequence of events which can be so aptly called the 'lifeboat imbroglio'? Just as important as finding specific solutions to lifeboat safety in the short term, for the long term we must try to gain an appreciation of the possible ramifications of regulatory action and reaction subsequent to a major accident. Experience has shown how well-meaning requirements and seemingly unobtrusive wording, such as 'adequate protection', can backfire in the worst possible way. IMO and the various member states and representatives, now on the verge of plunging full on into a 'goal-based regime', must realise the importance semantics can play in a safety regime.

Following the aviation model, standardisation for safety critical systems and equipment should be envisioned. Many other aspects of ship operations, bridge ergonomics and layout for example, could learn from the aviation industry. The aviation model also illustrates the importance of manufacturers' proactive involvement and cooperation subsequent to an accident or in the context of a review or study. Here again the maritime industry could learn a great deal.

Finally, what can be said about the lamentable time lag of the lifeboat imbroglio? As early as 1994, the OCIMF survey into lifeboat accidents was right on the mark. Yet here we are, 14 years later and more than 20 years after serious accidents began to occur with lifeboats, still grappling with the same issues. Accident and near miss reporting must be enhanced and results sent to IMO in the timeliest manner. Ideally, novel designs should be intensely scrutinised under a risk-based approach. Bad designs and technical weaknesses must be quickly identified and culled from the system without hesitation. To do anything less is to shirk our collective responsibilities and unnecessarily risk the lives of innocent, hard-working crew and the general public.