Lifeboat Launching Systems

Introduction

The Marine Accident Investigation Branch (MAIB), the agency that investigates accidents in U.K. waters, maintains a database on which all reported accidents are collated. This data has been accumulated over the last 10 years and indicates that lifeboats and their launching systems have cost the lives of 12 professional seafarers or 16% of the total lives lost in U.K. waters during the period. These accidents all occurred during training exercises or testing with experienced qualified seafarers either performing or supervising the operations. The report concludes that there are significant risks when using lifeboats and maintains there is a clear need for the marine industry to reconsider the effectiveness or indeed the need for lifeboat launching systems.

The need for lifeboats, as opposed to other life saving apparatus, is based on the conception that the survival craft should be capable of being navigated independently. With the advent of Global Maritime Distress and Safety Systems (GMDSS) the need for a navigable survival craft has now largely disappeared. The MAIB study found that people using lifeboats are exposed to the greatest risk during embarkation and recovery and argues that if the number of people involved during these times can be minimised, the risks to individuals can be reduced and so will the loading on the equipment.

On-load Release Hooks

The most common cause of fatal accidents involving lifeboat launching systems is due to the failure of on-load release hooks - 7 fatalities over the last 10 years. SOLAS requirements for ships built after 1st July 1986 stipulate that lifeboats should be fitted with a hook disengagement gear capable of being operated both on and off-load. Many on/off-load release hooks have become over-complicated and crews generally have a poor understanding of the operating principles involved, often because of inadequate training, poor labelling, complex mechanisms and hard to follow operating instructions. Analysis of a number of accidents revealed that premature hook release is often caused by failure to reset the hook correctly when recovering the boat from its previous launching - once the hook is incorrectly reset spontaneous release is possible at any time prior to lifeboat being returned to the water. Further information on this topic is contained within the training video "On-load Release Mechanisms" produced in association with Videotel (Club Circular B268 dated June 1997).

SOLAS Chapter 3 (Lifesaving Appliances) was amended again in June 1996 and lifeboats were required to have special mechanical protection to counter the possibility of accidental or premature release of hooks but, despite these developments, problems still exist. Some Flag States have waived the requirements and operating procedures may not differentiate between releasing on and off-load. Releasing cables are usually Bowden or Morse cables (an inner wire protected by an outer sheath) and once these cables have corroded they cannot be repaired. Often management and crews are unaware of the requirements for maintenance or replacement and cable failure, as well as complexity of design, has been clearly linked to operational problems.

Over-complicated design of systems and their components require extensive training to operate correctly, but without high-quality instructions or operating manuals seafarers are unlikely to acquire an adequate understanding of the system. This is supported by a 1996 amendment to SOLAS which requires thorough examination and testing of systems during survey by properly trained personnel familiar with the design. Unfortunately, this amendment is not included in the legislation of many flag states.

Bowsing and Tricing

If a lifeboat is not boarded in its stowed position, it must be capable of being held against the ship’s side for safe embarkation. This is achieved, conventionally, by the sequential use of tricing pennants and bowsing tackles. The lifeboat is lowered to the embarkation level while the tricing pennants pull it into the side of the ship. Once at the correct level the bowsing tackles are secured between the davit blocks and the ship's structure, the tackles are then tightened to hold the boat alongside, and the tricing pennants disconnected. This process can be time-consuming, especially when bowsing tackles are heavy and awkward to handle, particularly in high capacity lifeboats. Consequently, the bowsing procedures are often ignored during exercises with crews viewing such tackles as cumbersome and/or unnecessary. What starts as a convenient measure then develops into accepted practice which may well lead to injuries during training or drills and worse still if the procedures are ignored in an emergency.

A potential danger in the use of tricing pennants should also be recognised. Under normal circumstances the boat fall (wire) goes through the davit sheaves and part of the weight of the boat is taken on the fall anchorage positions. Tricing pennants are attached to the davit arms and if the falls are allowed to run slack the entire weight of the boat is transferred onto the davit arms, via the tricing wires, and may cause one or both arms to overload and fail. Further, if bowsing tackles are not being used, the added weight of embarkation may overload the tricing pennants causing the boat to swing uncontrollably if a pennant failed, endangering anyone who happened to be embarking at that particular moment and/or, if an open boat, tipping people into the sea.

Maintenance and Repair

Efficient winch brakes are essential to the safe lowering of lifeboats and to ensure they function correctly they must be regularly and correctly maintained. Often regarded as straightforward items of machinery and very suitable for maintenance by ship's staff, two fatal accidents have resulted due to this work not being carried out correctly. The ship's engineer is unlikely to have received any type of specific training for the task and may not find the maintenance manual sufficiently comprehensive or accurate for his needs.

Limit switches are regarded as part of the winch system and they often malfunction. Winch motor controls have also failed. If this prevents the motor being stopped while hoisting, it can lead to other components being damaged. Crank handle interlock switches designed to isolate the power from the winch motor sometimes fail and the handle begins to turn when the motor is started. Injury often results. Common factors in the failure of many of these switches include the ingress of water and inappropriate or careless application of paint.

Free-fall Lifeboats

When training has been completed and a trial launch experienced, ships’ crew appear to quickly develop and maintain a confidence in the free-fall concept. This level of confidence is in sharp contrast to the lack of enthusiasm by experienced crews with some davit launch lifeboats. Some degree of physical mobility and fitness on the part of the occupants is required and as such may prevent the widespread use of free fall boats in passenger ships, where a number of people may lack the necessary levels of fitness or health to withstand the impact of the boat entering the water. Manufactures state testing boats in free fall do not

affect the structural condition and claim some boats have been dropped over 2,000 times without significant damage.

Lloyd's List of 1st February 2002 reported that a free-fall enclosed lifeboat was credited with saving the lives of 14 seafarers who abandoned their sinking ship in freezing conditions during a storm in the North Atlantic. The crew were able to launch despite the violent motion of the sinking ship, which would have made escape in a conventional lifeboat doubtful. The entire crew were picked up uninjured some 350 miles east of Newfoundland.

Other Accidents

Most of the accidents and all fatalities have occurred during the lowering, launching or recovering of davit launch lifeboats. Several accidents occurred where people have fallen from the lifeboat, one officer, not wearing a lifejacket, lost his life when he fell from the boat whilst manoeuvring under the falls. Risks are reduced when the number of people within a lifeboat during launching and recovery is kept to a minimum.

Crew Confidence

Since 1989 there has been no incident reported under the U.K. regulations of a merchant vessel using lifeboats to evacuate passengers or crew in an emergency. Some Masters have reported that to raise their crew's confidence in the system they regularly take an active part in launching the lifeboats. However, it seems that number of people no longer feel that carrying out drills is really safe and some crews seem to be reluctant to train with lifeboats. If this reluctance is wide spread the necessary skills may not be readily available in the event of a real emergency.

Conclusions

Data collected by the MAIB indicates that the number of lives lost to lifeboat launching systems equate to those lost entering enclosed spaces – a recognised hazardous procedure. Further, these accidents occurred during training exercises involving experienced qualified seafarers.

There is an urgent need for clear launching system operating instructions, including procedures for safe handling and maintenance, to be drawn up and implemented. Besides keeping the number of people physically involved in turning boats out to an absolute minimum, the following points should be noted:-

- Assess prevailing weather conditions prior to holding Boat Drills
- Crew to muster in warm clothing, proper shoes and wearing lifejackets
- Keep personnel clear of all moving parts
- Lifebuoy(s) available at the embarkation position(s)
- Ensure all working parts are well lubricated
- Ensure all limit switches are operational
- Ensure Winch brakes are free from grease, regularly inspected and maintained
- Ensure lifting hooks are correctly engaged prior to turning out/lifting the boat
- Engage portable winch motor torque attachment(s) prior to starting motor
- Remove winch handles prior to starting winch motor
- On completion of drill check on/off load release hooks are correctly closed

- Ensure Crew in free fall boats are properly buckled up

SOLAS III Reg. 18 / 3. Sets out very clearly the requirements for practice musters and drills. Whilst the turning out of at least one boat each month remains an international requirement it is most important that ship's complements are made aware of the hazards involved and are properly trained in the correct use of the lifeboat launching system installed on their ship.

US Coast Guard Safety Alert of March 2002.

The US Coast Guard issued this Safety Alert on 28 March 2002**:**

Recently a 16-man liferaft canister weighing 375 pounds was accidentally released from its cradle while being loaded in a West Coast port. The canister fell approximately 50-feet onto an engineering service technician who was departing the vessel. The technician suffered massive internal injuries and passed away several hours later at a local hospital. At the time of the incident, two port side life raft canisters were being stowed onto a duplex cradle. The liferafts had just been returned from their routine annual inspection and servicing at a local facility.

The liferaft cradle holds two canisters and utilizes two independent releasing mechanisms. Upon release, the liferaft will fall over the side of the vessel. During loading, there were two accidental releases of the canisters. Although the investigation is not yet complete, the sequence of events may have been as follows:

The first canister was loaded onto the cradle and the second canister was being lowered into position. During this process one of the individuals involved bumped the releasing handle of the canister already in place causing it to fall off the vessel's port side and onto the dock. Shortly afterwards, another person involved examined the releasing mechanism for the second canister. He noticed that the releasing lever was not seated securely. In an effort to prevent the remaining raft from falling, he attempted to move the lever and seat it into its locked notched position. As he moved the lever it sprang open releasing the second canister from its cradle. It plummeted from the vessel and stuck the service technician below.

The Coast Guard strongly recommends that vessel owners and operators utilizing gravity type liferaft release mechanisms or other equipment with similar operating characteristics:

- Review and develop, if necessary, procedures for safe loading of liferafts, particularly when there is danger associated with accidental release.
- Review and develop, if necessary, training based on the safe loading procedures and ensure individuals associated with liferaft loading operations are trained.
- Ensure that each liferaft canister is immediately secured in place using a line, chain or other method when loading or conducting maintenance on the canister, releasing mechanisms or cradles.
- Prohibit use of releasing system hardware as the only means to secure the canister in place during loading, maintenance and repair activities.
- Secure dock and vessel areas within the release zone anytime that maintenance is conducted on lifesaving systems located at the deck edge or when equipment is not stowed as designed. Similar precautions should be taken whenever work of any kind is taking place at the deck edge above other decks or dock areas where people may be present.
- Require only authorized persons to conduct a thorough inspection and safety assessment of the equipment and surrounding areas prior to securing, loading or any other associated maintenance activities.