
Operational Issues relating to Marine Evacuation Systems

Notice to all manufacturers of Marine Evacuation Systems (MESs) and Lifejackets, and Operators, Masters and Officers of ships equipped with MESs

Summary

Trials have shown that some lifejackets used with Marine Evacuation Systems have a greater sensitivity than others to “riding up” as an evacuee descends the passage. This effect is particularly marked in systems comprising a vertical chute. Operators should consult MES manufacturers for guidance about the most suitable lifejackets for use with the system and provide these for MES evacuation within a reasonable period of time (e.g. by the first survey after 31st October 2004).

Other operational issues have also been highlighted, including the need for the provision of appropriate guidance when dealing, for example, with safe descent of infants and the disabled. Appropriate training of crew members in all aspects of MES operation is vital, particularly with respect to crew response in the event of anomalies occurring during deployment.

Background

1. During a recent evacuation drill in the UK using a Marine Evacuation System (MES) an evacuee became lodged in the passage and subsequently died. The Marine Accident Investigation Branch (MAIB) investigated the accident and has since published a report that included recommendations for the Maritime and Coastguard Agency (MCA). An inquest was also held.
2. The MES employed on the day of the drill was of the vertical chute type. The trial proceeded normally, and over 100 of the approximately 250 volunteers had successfully descended the chute to the liferafts when an evacuee encountered problems. The evacuee was found stuck in one of the cells of the chute, in a “piked” position (arms and legs above the head), still conscious, although their lifejacket and
3. jacket had come off. The evacuee subsequently lost consciousness and the chute had to be cut in places to allow the evacuee to complete the descent. Despite immediate first aid and evacuation to hospital the evacuee died.
4. Although there is no evidence that riding up of the lifejacket caused the fatality it is probable that it was the initial mechanism leading to the evacuee becoming stuck in the chute. In addition to the direct risk to the individual, as demonstrated in this trial, such a blockage could delay an evacuation in an emergency.
5. It should be noted that accidents of this kind are believed to be very rare, with around 5000 successful descents to date in this make of MES alone.

Safety Recommendations

5. Several key findings were identified in the MAIB report. These included:
 - (a) the riding up of the evacuee's lifejacket either stopped them in the chute or slowed them down such that they spread their legs;
 - (b) it is probable that the initial mechanism for causing the evacuee to become stuck, was the riding up of their lifejacket;
 - (c) the "sweeper" (a member of the crew trained to clear such blockages) needed some sort of apparatus to help them lift the evacuee out of the piked position;
 - (d) on board ships there are many types and makes of lifejackets, some of which have a tendency to ride up during the descent of MES chutes;
 - (e) there is a need for the approval, both in the UK and internationally, of suitable lifejackets, which provide a safe descent for MESs;
 - (f) sweepers need more effective means to clear blockages, especially during an emergency, when it is essential to keep the chute operational at all times;
 - (g) although very few accidents occur during drills, there should be a specific worldwide accident reporting method to the International Maritime Organization (IMO) which can collate the evidence.
6. From the above findings, three recommendations were made to the MCA in the MAIB report:
 - (a) ensure that all lifejackets on board vessels equipped with MESs within MCA's jurisdiction, are suitable for safe descent with the specific MES installed;
 - (b) take to the European Union (EU) for action with regard to the EC Marine Equipment Directive and forward to the IMO the requirement that all lifejackets on board vessels equipped with MESs worldwide, are approved for use with the specific MES installed;
 - (c) take forward to the IMO that a reporting system should be set up, to gather reports of all accidents involving MESs.
7. At the Inquest into the fatality, the Coroner also made three recommendations to the MCA:
 - (a) a lifejacket which can be pulled off the wearer should not be used in a vertical chute MES;
 - (b) sweepers should receive adequate training and should carry equipment to assist in the freeing of a trapped evacuee;
 - (c) a comprehensive system of collecting data of injuries/deaths associated with MESs should be created.

Lifejacket Compatibility

8. Although there is no evidence that riding up of the lifejacket caused the fatality it is probable that it was the initial mechanism for causing the evacuee to become stuck. Trials have shown that some lifejackets used in MESs have a greater sensitivity than others to ride up, flip up, or otherwise become dislodged as the evacuee descends the passage.
9. The manufacturer of the system involved is establishing a database of lifejackets used successfully on ships with their systems.
10. Manufacturers of MESs should assess the performance of lifejackets with their systems to ensure the greatest probability of safe descent of the passage, and safe access to and entry into the associated rafts. Operators and lifejacket manufacturers are requested to provide appropriate assistance.
11. Operators should consult MES manufacturers for guidance about lifejackets suitable for safe descent of the passage and access to and entry into the rafts, and provide these for MES evacuation within a reasonable period of time (e.g. by the first survey after 31st October 2004).

“Sweeper” Training and Equipment

12. The manufacturer of the MES system involved in this casualty has developed a standard list of sweeper kit required for use during an MES deployment (whether drill or emergency). This includes devices to assist with holding position in the chute, a method of communication with crew at top and bottom of chute and apparatus to help evacuees out of problem positions.
13. Manufacturers and suppliers of other systems should review their equipment and develop equivalent provisions and training requirements, and distribute these to operators of their equipment. Operators should ensure that the necessary equipment is provided and is stored adjacent to the evacuation stations and that additional training is undertaken as defined by the MES manufacturers.

Evacuation of Infants and the Disabled

14. The MAIB investigation also drew attention to the specific evacuation needs of the injured, disabled and infants less than 5 years old when using MESs. Tests have now been carried out on the MES system involved to optimise methods for safe descent.
15. The manufacturer of the system involved in this case has developed a method for their particular system for holding an infant during the descent of the chute; this is now specified in the crew instruction manual. Operators should ensure that full crew training takes place to test the suggested method, and to familiarise crew with the specific installations and equipment, during deployments planned over coming months. Medical opinion indicates that the risk to an infant descending the chute is no greater than that of being carried normally by an adult.
16. It is advised, where necessary, that the disabled are strapped to a stretcher and lowered down the chute using some form of arrangement provided for use by the sweeper. These tests have demonstrated that such vertical chutes are suitable for use in an emergency by infants and the disabled.

17. Manufacturers of other systems should develop and demonstrate appropriate procedures for holding and guiding an infant down the chute or passage, and for the best method for descent of an injured or disabled person.
18. Operators are to ensure that adequate training and procedural information from the manufacturers is available on board for the use of relevant crew members and inclusion in on board training manuals. Manufacturers are to ensure that such information is provided to the operators.

International Action

19. This incident has highlighted the wider issue of compatibility of lifejackets, not only in the case of MESs but also in the use of other types of survival craft. This is in line with the principles of SOLAS III/7.2, namely that lifejackets should not impede access to survival craft.
20. In response to the MAIB report and Inquest recommendations, the MCA has provided information, similar to that given within this MGN, to the IMO Design and Equipment Sub-Committee (DE 47), which is currently considering the matter of compatibility of components of life saving appliance systems. The MCA is working to ensure that MES manufacturers, ship operators and lifejacket manufacturers formally address the issue of compatibility.
21. The UK has also requested the IMO Flag State Implementation Sub-Committee (FSI 12) to update the IMO casualty reporting system to include further details on incidents involving life saving appliances and ship evacuation, as recommended by paragraphs 6(c) and 7(c). This should provide reliable statistics to assess safety of life saving appliances.

Conclusions

22. This paper brings to the attention of manufacturers and operators the need for compatibility of lifejackets with MESs. It is issued in anticipation of further work to be carried out at IMO in the near future, following which additional guidance or amendments to regulations may be forthcoming.

23. It should be noted that the shipowner or operator remains responsible for ensuring, with advice from manufacturers, that the ship system as a whole is fit for purpose, in addition to SOLAS compliance of individual items of equipment, and provides for an efficient means of abandonment.

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