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EBA Position Statement
Alternatives to Flares for Distress Alerting

Executive Summary

For some years now, it has been apparent that the prescribed use of pyrotechnics as a primary visual signal for distress alerting and locating a vessel requiring assistance has a number of limitations that would suggest that the use of pyrotechnic visual signals for distress alerting is unreliable and that their carriage should now be reconsidered in the light of modern technology.

Research undertaken in the USA has shown that EVDS can replace pyrotechnic flares. The European Boating Association[1] (EBA) believes the time has come to review the dangers of pyrotechnic flares against the benefits for Recreational Boating[2].

Background

Flares were developed as alerting and locating devices in the days when most boats had no electronic equipment and the coast was manned with coastguard lookouts. Flares provide the user with 2 functions; raising a distress alert and indicating the location of the casualty once the Search and Rescue (SAR) services had been mobilised.

The use of pyrotechnics as a primary visual signal for distress alerting and locating has a number of limitations:

- A rocket parachute flare will only burn for about 40 seconds and a handheld flare for about one minute;
- Only a limited number of flares can be carried and these can be quickly used without attracting attention, even within main shipping lanes; particularly if visibility is poor.
- Prototype and batch release operation and testing is only carried out by the manufacturer at ambient temperature;
- There is no assurance that the product will work when operated i.e. they cannot be pre-tested by the end user;
- There is a possibility of injury to the operator or damage to the craft whilst using pyrotechnics;
- Pyrotechnics have operated accidentally within sealed life rafts i.e. when drop tested, causing significant damage to the liferaft and components;
- Their use can be abused;
- They only have a three- or four-year life from the date of manufacture, which also includes storage time and transportation;

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- There are major problems with the disposal of these products at the end of the serviceable life.

These limitations would suggest that the use of pyrotechnic visual signals for distress alerting is unreliable and that their carriage should be reconsidered in the light of modern technology.

Current situation

It is generally accepted that it is prudent to carry a method of sending a distress alert and identifying location should SAR services be required. In the past, the carriage of flares has satisfied both of these functions and the distinction between the two has become blurred.

COLREGs Annex IV makes it quite clear that any flare is an internationally recognised signal for indicating distress. The fact that a fired flare must be seen and recognised as a distress alert obviously provides visual location. However, a flare must be seen and understood before a third party takes action to raise an alert. Fire a flare and there can be no certainty that this sequence will have worked.

This position paper therefore considered the alternatives to flares in two parts:

- Alerting – what is currently specified or recommended to be carried to raise a distress alert;
- Location – what is currently specified or recommended to be carried to indicate your location to someone who is searching for you.

Alternatives for alerting

Since 1 February 1999, the introduction of the Global Maritime Distress and Safety System (GMDSS) has automated many marine functions and processes, particularly those related to distress and safety; as its name implies it is global.

Today the vast majority of search and rescue incidents are triggered by Emergency Position Indicating Radio Beacons (EPIRB) and Personal Locator Beacons (PLB), VHF Digital Selective Calling (DSC) or a voice distress call on channel 16.

EPIRB and PLB

EPIRB and PLB operate on the 406Mhz global satellite rescue system ensuring that a distress alert signal can be sent from anywhere in the world. Many have a built in GPS which sends a highly accurate location position (typically +/- 50metres) within a few minutes of activating the unit. Provided a beacon is properly registered, this enables the rescue authorities to greatly reduce their search time.

VHF DSC

GMDSS has automated marine VHF radio distress alerting by the use of DSC technology. Equipment is relatively inexpensive, simple to use and easy to install. Activation of a single button automatically sends a distress call to all DSC equipped vessels and Rescue coordination centres in sea area A1 where continuous alerting by DSC is available. The call automatically includes:

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- Identity.
- Position (if a GPS receiver is connected).
- Nature of distress.

Furthermore, the call will be automatically repeated until stopped by an acknowledgment message.

The technical and operational advantages of EPIRB and PLB and VHF DSC for alerting far outweigh those of parachute flares. Unlike parachute flares, these methods of alert automatically give the SAR services all the information that they need to come to the aid of the vessel in distress. Flares require a third party to observe and act appropriately and there is no confirmation that they have done so. Typically, battery packs have a 5-year life.

Alternatives for Locating

Given that there are now proven alternative distress alerting methods that can be used by recreational boaters, alternatives to flares for locating a casualty need to be considered.

EPIRB and PLB
Modern EPIRB and PLB also transmit a 121.5 MHz homing signal which enables the SAR services to move directly towards your location. 121.5MHz is the International Search and Rescue homing frequency and can be tracked precisely by SAR services from up to 30 miles away. There are clear advantages to EPIRB and PLB for alerting and locating.

Radar Search and Rescue Transponder (Radar SART)
A Radar SART is complementary to an EPIRB or PLB and allows any vessel carrying an X Band marine radar to find a vessel in distress even in very poor visibility. Once activated, the SART causes a series of 12 dots to appear on the radar screen of any vessel within a range of about 5 nautical miles. The dots are quite distinctive and stand out from the normal radar responses - giving the search vessel both the bearing and range to the SART which will be within 100 metres of the last dot. They can be thought of as 'active' radar reflectors as they electronically enhance the echo received by radar. Additionally, a SART may be activated in "situations of grave and imminent danger". Recreational boaters may consider it a worthwhile item to carry if planning to cross shipping lanes in a small vessel. If trouble is encountered or there is a danger of being run down, activating the SART should quickly get the attention of the watch keeper on the approaching vessel.

AIS Search and Rescue Transponder (AIS SART)
From 1 January 2010, AIS-SART was adopted into the GMDSS regulations as an alternative to the X Band Radar-SART. The AIS-SART is detected on both AIS Class A and B. It derives position and time synchronization from a built in GPS receiver and transmits its position with an update rate of 1 minute. Every minute the position is sent as a series of 8 equal position reports over 14 seconds, which maintains a high probability that at least one of the position reports is sent on the highest point of a wave motion.

Anybody who can receive and detect an AIS signal will also detect an AIS-SART. In addition, an AIS-SART can also be visualized on an electronic chart if connected to the AIS transponder

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onboard. Tests were performed in Oban, Scotland in September 2008 to determine the obtainable range from a SAR helicopter. The signals were picked up at distances between 26 nautical miles and 40 nautical miles at flights levels varying from 300ft up to 2,500ft. These range tests, together with previous tests performed from helicopter and ships, show that AIS-SART has superior performance compared with other locating transmitters (121.5 MHz, radar-SART).

Electronic Visual Distress Signals (EVDS)
These devices offer a simple and effective way of pinpointing your position to a rescue ship or aeroplane searching for you. The EVDS emits an extremely bright beam which is pointed at the target and moved slowly back and forth across it. The rescue crew will see a flashing red light which they can to home in on.

EVDS have a number of advantages over pyrotechnic flares for guiding rescuers to the casualty:

- Longer in-use life. A typical pyrotechnic flare, a one-off device, lasts for a minute whereas an EVDS lasts for hours. Whilst this depends on the weather and the amount of ambient light, in clear conditions light can be seen out to 20 miles by night. By day they are visible out to 3 miles.
- Location. EVDS can be used to illuminate reflective materials such as those on oilskins and lifebuoys out to a range of 1 mile.
- Ease of use. Having a simple twist method of switching on and off, EVDS are easy to use. Unlike a pyrotechnic, they can be tested periodically.
- Safety. EVDS are battery powered and are not a fire hazard. They are much safer to use than a pyrotechnic flare and they can be carried by air.

In the past there has been notable resistance to EVDS being accepted as a replacement for pyrotechnic flares. However, a significant milestone has been reached in the United States, as following research and testing, the Coast Guard is transitioning in 2026 from a requirement to carry three MK 124 Marine Smoke and Illumination Signals to an approved electronic Visual Distress Signalling Device.

The EBA Position on Alternatives to Flares for Distress Alerting

The EBA encourages authorities to reconsider prescribing the carriage of pyrotechnics which are unreliable and potentially hazardous to health and instead look at the safety benefits and effectiveness of modern alternatives.

In light of the research and resulting decisions that have been reached in the USA, the EBA believes that it is now time for the international community to review Annex IV COLREG and include EVDS as an internationally recognised signal for indicating distress.

Once EVDS have been recognised in Annex IV of COLREG, EBA believes that the carriage of pyrotechnic flares should not be mandated on any recreational boats. However, the EBA believes that recreational boats should be able to carry pyrotechnic flares on a voluntary basis if the owner wishes to do so.

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Notes

[1] **European Boating Association**

The European Boating Association, Europäischer Sportschifffahrtsverband, Association Européenne de Navigation de Plaisance, is a civil, not for profit association of recreational boat users' organisations, founded in 1982, and established as an Unincorporated Association whose members agree to be governed by its constitution. The EBA member organisations (see http://www.eba.eu.com/participantorgs) collectively represent in excess of 1.5 million recreational boaters and an estimated 20 million active participants.
The purpose of the EBA is to represent the mutually agreed common interests of national recreational boat users' organisations in Europe, and in particular to:

- Coordinate and develop recreational boating activities in Europe by exchange of information, and action on matters of mutually agreed common interest.
- Promote the practice of all activities on the water, promoting and exchanging knowledge and experience between recreational boat users' organisations in Europe.
- Represent EBA members in environmental, regulatory and technical matters affecting their safe enjoyment of recreational boating activities on the water.
- Encourage the safe, unhampered and environmentally sustainable use of recreational boats on all European waters.
- Provide the link between the European institutions and EBA Members for consultation and information on proposed EU directives and regulations.
- Provide the link between other relevant global and regional organisations and EBA Members.

[2] **Recreational Boating**

The EBA is the European representative organisation for recreational boating.

There is no general consensus as to the terminology used to describe the types of boat used for "recreational boating", with expressions such as "recreational craft" or "private pleasure craft" being used to describe only subsets of such types of boat for the purposes of specific pieces of EU legislation. "Recreational boating" also includes the use of beach- or slipway-launched water toys such as wind surfers, sailing dinghies, inflatable boats and personal watercraft.

Boats used for "recreational boating" may be small or large, propelled by sail and/or power and used on inland waters and/or at sea. "Recreational boating" at sea can range from close-to-shore to trans-oceanic.

"Recreational boating" also includes the use of such boats privately owned and operated by the owner, hired (on bareboat or skippered charter) or used to provide a service (such as training or race participation).

In the context of this document, therefore, the EBA considers "recreational boating" to mean using boats that are designed or adapted for sport or leisure, whether propelled by sail and/or power, for the purposes for which they are designed or adapted.

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