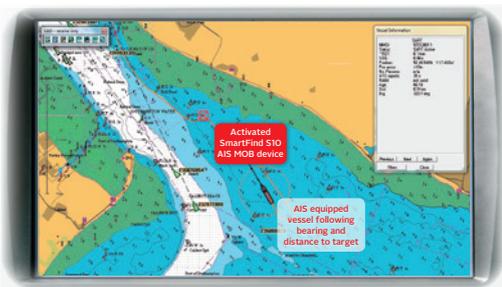# FAQ

AIS MOB

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Plotter showing AIS MOB detail.

What is the Purpose of an AIS Man Overboard (MOB) Device?

Man Overboard devices provide immediate notification to the parent or neighbouring vessels relating to a *Man Overboard* (MOB) incident and provide a means of location to determine the position of the MOB. Finding a MOB in the water and navigating your vessel to their location can be difficult, particularly at night or in strong tides. A survivor recovery system which uses AIS MOB, to automatically contact the crew member's vessel, greatly increases the chances of identifying the MOB's location and aiding recovery via locally orchestrated rescue.

Why should an AIS device not be referred to as a PLB?

The AIS MOB device provides real time positioning to support localised rescue by using the Automatic Identification System, an electronic navigation system established originally as a collision avoidance and safety system for commercial vessels. However, AIS MOB devices are not part of the COSPAS SARSAT dedicated emergency 406 frequency search and rescue network and therefore should not be referred to as Personal Location Beacons.

What are the Pros and Cons of Personal Location Beacons (PLB) for MOB scenarios?

A Personal Location Beacon (PLB) is a personal safety device designed to alert search and rescue services and allow them to locate you. When activated it transmits a coded message on the 406 MHz distress frequency which is monitored by the COSPAS-SARSAT satellite system. The alert is then relayed via a local user terminal (LUT) to the nearest Rescue Coordination Centre (RCC).

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Distress Beacons • Satellite Connectivity Infrastructure • Monitoring/Positioning Software • Emergency Response Management

The national authority forwards the data to a rescuing authority. A PLB can have an internal GPS receiver to pinpoint your location to within +/- 62m. Once in the area, rescue services are then able to home in on your precise location using the inbuilt 121.5 MHz homing signal.

The issues in using a 406 MHz PLB in a MOB situation are the variable latency period from activation to rescue depending on location and that vessels in the vicinity, including the Mother vessel, aren't alerted to an MOB incident until they are contacted by shore Search and Rescue authorities, which limits opportunity for local recovery.

A 406 MHz PLB is not primarily designed as an aid to a local recovery, as its distress alerting is dependent on communication with the official SAR network whereas, a localised alert via an AIS MOB device would greatly increase your chances of local identification and rescue should such support be available.

What Happens When an AIS MOB Device is activated?

Once activated the position of the AIS MOB device will be displayed as a GPS located target icon on ships in the vicinity with AIS enabled plotter screens. They do this by repeatedly transmitting an AIS message type MSG1 *(class A position report)* and MSG 14 *(safety broadcast message)* alternating quickly between both AIS channels AIS1 and AIS2.

A burst of 8 MSG1 messages repeat every 1 minute, with the cycle of messaging repeated many times to overcome wave action and to achieve line-of-sight to a nearby vessel. In a heavy sea with the AIS device close to the sea surface, wave swell can block the transmissions. This is overcome via information being repeated every 2 seconds (over 14 seconds), ensuring some transmissions will coincide with the survivor being on a wave crest, allowing "line-of –site" path for message relay . The vessel will get a range and bearing to the exact location which is updated, in real time to recover the drifting MOB.

What is the difference in SAR solutions between a MOB incident and a vessel in distress?

Localised rescue supported by an AIS MOB device offers the most effective solution to recovering an individual involved in a man overboard incident, as it reduces time in the water and ultimately fatalities. When an incident involves a vessel in distress, rather than a MOB incident, localised rescue is not necessarily an option but there is an extensive range of search and rescue solutions available, particularly with GMDSS mandated equipment

An S20 AIS MOB fitted to a Lifejacket.

for commercial vessels.

The primary tool in a vessel incident is the Emergency Position Indicating Radio Beacons (EPIRBs) on the vessel bulkhead, which when activated transmits a message on the 406 MHz distress frequency which is monitored by the COSPAS-SARSAT satellite system. The alert is then relayed via an earth station to the nearest Rescue Coordination Centre (RCC). For the crew in the water or life raft 406 MHz PLBs act as personal EPIRBs and also broadcast their position to the rescue authorities.

Search And Rescue Transponder (SART) are a radar or AIS based emergency transmitter that is designed to be used in conjunction with life rafts in the event that it is necessary to abandon ship. Finally GMDSS mandated VHF radios provide an additional emergency

MOB incident results in activation of AIS MOB device, which transmit a localised locating signal on maritime VHF frequencies to a range of 4 miles (appx).

The AIS MOB position is sent 8 times per minute, using an 'impolite AIS protocol' ensuring the AIS MOB message is given priority. The signal is displayed on plotter screens on vessels within the broadcast radius.

The AIS message content includes the unit ID number, GPS position fix data and a simple text message, to highlight the MOB incident and provide all the information required to support a localised rescue.

communication channel.

How has AIS technology improved SAR?

AIS (Automatic Identification System) has been one of the most important innovations in navigation since the introduction of GPS. It is one of the fastest-growing

segments of the electronic navigation business in recent years, with at least 170 countries mandating its use. Providing a tool for improved safety and collision avoidance, AIS is currently mandated on all commercial vessels over 300 tonnes and the EU Fishing mandate for AIS and market sizes states that EU Fishing vessels will gradually need to be equipped with Class A AIS. The development of collision avoidance AIS ensures AIS MOB is an effective complementary localised rescue solution alongside the dedicated 406 Cospas-Sarsat Search & Rescue ecosystem.

Why did the McMurdo Group Develop a non 406 SAR device?

Time is often the most important factor in rescue operations and that more effective, faster rescues could be undertaken locally, significantly reducing the likelihood of death or injury, McMurdo developed its' range of AIS MOB products. The Smartfind S20 & S10 Personal AIS MOB Beacon have been specifically designed as a personal AIS locating devices to efficiently locate and retrieve a missing crew member.

How does the Smartfind AIS MOB device interact with AIS navigation plotters?

The Smartfind is activated (manually in the S10, Automatically on lifejacket fitted S20) in an emergency crew recovery situation. The alert message is transmitted to all AIS receivers and AIS enabled chart plotters within a 4 mile radius (typical) and an AIS SART MOB icon normally marks the survivor's location. The precise target survivor information including GPS position becomes viewable when the chart plotter cursor is positioned over the icon, highlighting exact location, distance and bearing to locate person (s) in need of assistance.

Is AIS a standalone rescue solution?

Like all marine safety and search and rescue solutions, their impact is greatest when supported with in-depth training and practiced procedures and in combination or integration with complementary products. For example, McMurdo's Smartfind S20 offers a semi-automatic activation feature when professionally attached to appropriate Lifejackets. One recent example of the beneifits of a 'combination' approach in an MOB incident, is the 2014 Clipper Race MOB rescue on board the *Derry~Londonderry~Doire*, credited to a *Henri Lloyd* dry suit insulating the MOB, an automatically deployed Ocean Safety Lifejacket and the manually operated Smartfind S10 AIS MOB plotter information, which facilitated retrieval by providing real
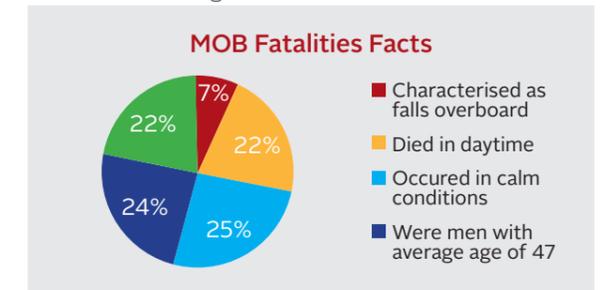
time bearing in very heavy seas.

What tool is most effective for solo sailors?

In a scenario where a MOB was sailing single handed with limited availability of localised support at the time of an incident, the most reliable tool to raise the alarm and seek outside assistance would be the use of a 406 PLB with GPS, such as the FastFind 220. The PLB effectively acts as the MOBs direct line to the coastguard via the Cospas-Sarsat network, ensuring SAR services know the owners details from their PLB registration and the location of the incident via the GPS enabled message.

IMO Estimated Deaths At Sea
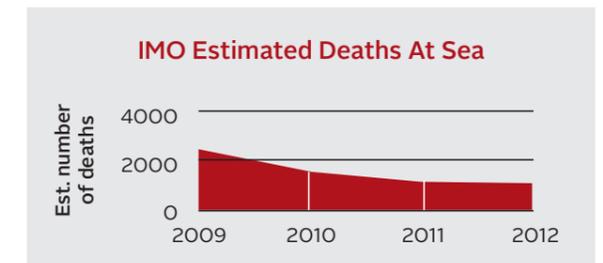
Why do Man Overboard (MOB) incidents warrant dedicated solutions?

Koji Sekimizu, Secretary General of the IMO, launched 'Accident Zero' Campaign in 2013 with the aim of reducing deaths at sea to below 500 p.a. Although the IMO's estimated figures show a reduction due to better

MOB Fatalities Facts

- Characterised as falls overboard
- Died in daytime
- Occured in calm conditions
- Were men with average age of 47

training and SAR solutions availability, fatalities still remain well above that target.

The *BoatUS Foundation* research offered analysis on some of the factors surrounding the 749 US MOB fatalities (between 2003-2007), surprisingly highlighting that 25% of fatalities occurring in calm weather.

The McMurdo Group have been at the forefront of innovation in lifesaving solutions for 40 years and are dedicated to the development of AIS MOB solutions that support the goals of the *Accident Zero* Campaign.

AIS at a Glance

What do AIS MOB devices do?

They transmit a localised locating signal on maritime VHF frequencies containing position, and course & speed over ground, derived from GPS.

What does the AIS MOB device transmit?

The AIS message content includes the unit ID number, GPS position fix data and a simple text message.

How often is the AIS MOB transmission made?

The AIS MOB position message is sent repeating 8 times once every minute. This amount of inbuilt redundancy means MOB message has a very high probability of local detection. It is only needed to capture just 1 of the 8 repeating burst transmissions to fully resolve the unit ID and latest position update on to the recovery vessels AIS plotter screen.

How far will an AIS MOB message be received when at sea?

A vessel using rail mounted VHF AIS antenna will typically receive the AIS MOB signal out to 4 miles range (typical). The high probability that one of the 8 AIS TX bursts (mention above) will occur while the MOB is cresting a wave top will enhance the launch of the transmission across the open line of site path to a distant receiving antenna.

What AIS messages are sent by the AIS MOB device?

Two types of messages are sent:-

1. A unit ID and Position report message (AIS message type 1)
2. A text message (AIS message type 14) including a simple message text 'MOB TEST' or 'MOB ACTIVE',

Will my AIS MOB message be heard in a crowded seaway?

AIS MOB transmission has a priority over regular AIS traffic. They transmit using an *'impolite AIS protocol',* this means AIS transponders in the same area will pause transmitting when they first hear the AIS MOB and then reschedule transmissions around the AIS MOB. This ensures that the AIS MOB can be heard even in a crowded seaway.

McMurdo Group Overview

McMurdo Group is a global leader in search and rescue and maritime domain awareness solutions, bringing together 140 combined years of experience by consolidating proven Boatracs, Kannad, McMurdo and Techno-Sciences, Inc. brands into the industry's most comprehensive portfolio of life-saving and tracking technologies. McMurdo Group distress beacons, satellite connectivity infrastructure, monitoring/positioning software and emergency response management solutions are used by maritime, government and military customers around the world to save time, costs and lives.

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