Ocean Signal MOB1 and ACR AISLink.
# What does the DSC add to the overall safety?

The Ocean Signal MOB1 and the ACR AISLink are widely known as a key safety product to integrate within your lifejacket. The MOB1 was DAME nominated when it was released.

What makes the MOB1 so special still and especially back in the days. Ocean Signal was the first to combine AIS and DSC within a beacon. Next to that its small size (therefore easy to integrate) and automatic activation upon lifejacket activation.

Which systems does the MOB1 combine?

AIS is intended primarily to allow ships to view marine traffic in their area and to be seen by that same traffic. It was not designed to be an alerting system at all. AIS uses SOTDMA (class A and Class B+ transponder) or CSTDMA (older class B transponders) for its transmissions. In order for a transponder to work properly it needs to build up a slot plan, (SOTDMA) or listen for an unused slot (CSTDMA). Next to that, to have proper alignment within the dedicated timeslot, a GNSS (e.g. GPS) fix needs to be obtained. All described above takes time, time that you don't have when dealing with an emergency such as a Man Over Board.

Transmissions from an AIS MOB are quite often referred to as being from an "impolite system" The SOTDMA scheme gives room (= a timeslot) for everybody to do transmissions, whereas an AIS MOB will, upon activation, make a transmission regardless of slot collision that may occur (lost transmissions)
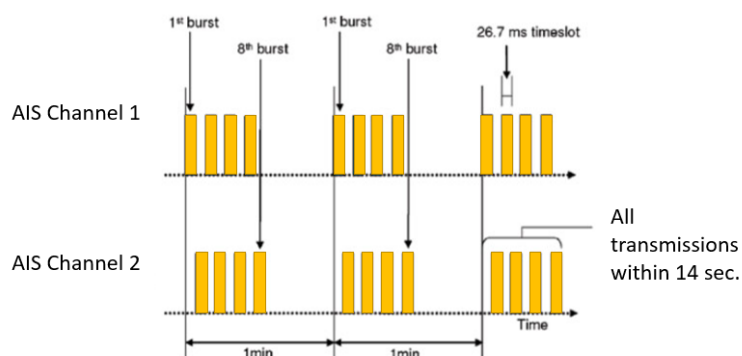
Therefore an AIS MOB makes a sequence of transmissions increasing the chance that at least one of the transmissions will not collide with other transmission.

DSC (Digital Selective Calling) was developed to replace a voice call in older procedures. Because a DSC signal uses a stable signal with a narrow bandwidth and the receiver has no squelch on a dedicated VHF channel (ch.70). DSC senders (MOB AIS Included) are programmed with a Maritime Mobile Service Identity (MMSI) and the format allows for GNSS information to be included, which allows the receiver to know who it is, what time it is and where it is.

AIS MOB devices can be recognized by the MMSI number starting with 972, AIS SART's will start with 970 whereas AIS EPIRBS will start with 974.

The priorities for communication are Distress, Urgency, Safety and routine. A Distress DSC call is called an Alert. Urgency, Safety and routine are called Announcements.

The MOB1 can send various types of DSC messages. The type message with the corresponding functionality of the MOB1 is limited by regulations in each country.

AIS only: Canada, France, Denmark, Latvia
AIS + DSC Individual Distress Relay call plus group call sent after 30minutes: USA
AIS + DSC Individual Distress Relay call only: Germany, Netherlands, Spain, United Kingdom
AIS + DSC Individual Distress Relay, All Ships Distress Alert (manual initiation only): All other European countries
AIS + DSC Individual Distress Relay, All Ships Distress Alert, sent once on MOB1 activation and on manual initiation: Rest of the World.
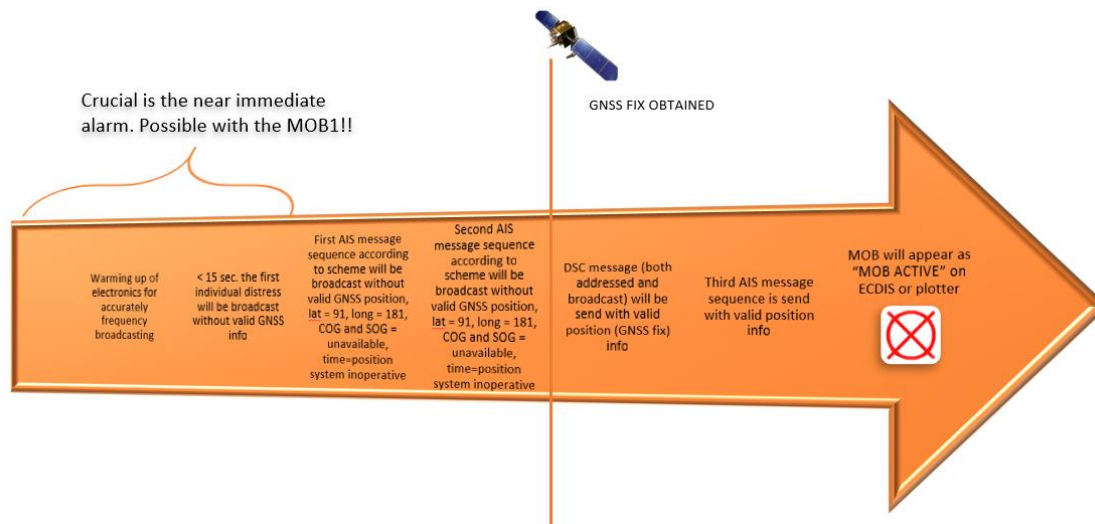
ALL Ships = broadcast message
Individual=addressed message to a pre-programmed MMSI number of the vessel
Distress= priority of the message
Relay= sent from either another vessel, (not the case because it comes from a 972 mmsi number) or a station (MOB1) on behalf of a vessel in need of assistance.

Sequence of operation when activated
The below example shows a GNSS fix after 2 min.

Crucial is the near immediate alarm. Possible with the MOB1!!

GNSS FIX OBTAINED

Warming up of electronics for accurately frequency broadcasting

< 15 sec. the first individual distress will be broadcast without valid GNSS info

First AIS message sequence according to scheme will be broadcast without valid GNSS position, lat = 91, long = 181, COG and SOG = unavailable, time=position system inoperative

Second AIS message sequence according to scheme will be broadcast without valid GNSS position, lat = 91, long = 181, COG and SOG = unavailable, time=position system inoperative

DSC message (both addressed and broadcast) will be send with valid position (GNSS fix) info

Third AIS message sequence is send with valid position info

MOB will appear as "MOB ACTIVE" on ECDIS or plotter

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