

RESOLUTION A.500(16) adopted on 10 October 1989  
CARRIAGE OF SATELLITE EMERGENCY POSITION-INDICATING  
RADIO BEACONS (EPIRBs)



OMI

INTERNATIONAL MARITIME ORGANIZATION  
ORGANISATION INTERNATIONALE DE MARITIME



ASSEMBLY - 16th session  
Agenda item 10

IMO

RESOLUTION A.660(16)

adopted on 19 October 1989

CARRIAGE OF SATELLITE EMERGENCY POSITION-INDICATING  
RADIO BEACONS (EPIRBs)

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECOGNIZING that emergency position-indicating radio beacons (EPIRBs) improve the safety of life at sea by greatly facilitating search and rescue,

RECALLING that resolution A.522(13) recommends Administrations to encourage the carriage of float-free EPIRBs operating on frequencies compatible with the existing satellite search and rescue services,

RECALLING FURTHER that the Maritime Safety Committee at its fifty-second session recommended carriage of survival craft radar transponders, as an equivalent arrangement to the survival craft EPIRBs required by regulation III/6.2.3 of the 1983 SOLAS amendments, and also recommended that the ship itself be fitted with a satellite EPIRB in order to provide the alerting function,\*

---

\* MSC/Circ.423 on "Equivalent arrangements for survival craft emergency position-indicating radio beacons".

W/2764e

NOTING that the Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974, on the Global Maritime Distress and Safety System (GMDSS Conference, 1988) adopted resolution 4 - Recommendation on the early introduction of GMDSS radio life-saving appliances, which recommends that, where a means of transmitting signals for locating is provided on board a ship, Administrations accept a satellite EPIRB as equivalent to the survival craft EPIRBs,

NOTING ALSO the favourable experience already gained with EPIRBs operating in conjunction with the COSPAS-SARSAT system,

NOTING FURTHER that the GMDSS Conference, by regulation IV/7.1.6 of the 1988 SOLAS amendments, has adopted provisions, applicable not later than 1 August 1993, for the carriage of a float-free satellite EPIRB on every ship as part of the global maritime distress and safety system,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its fifty-seventh session,

RECOMMENDS that Administrations encourage the early fitting of float-free satellite EPIRBs prior to the date of entry into force of the requirements of chapter IV of the 1988 SOLAS amendments for the carriage of satellite EPIRBs on ships.

\_\_\_\_\_

RESOLUTION A.660(16) adopted on 19 October 1989  
CARRIAGE OF SATELLITE EMERGENCY POSITION-INDICATING  
RADIO BEACONS (EPIRBs)

The Committee on the Safety of Life at Sea (CSL) has considered the proposal for the carriage of satellite emergency position-indicating radio beacons (EPIRBs) on ships. The Committee has agreed to recommend that the carriage of EPIRBs on ships should be mandatory for all ships of 100 gross tonnage and above, and for all passenger ships of 100 gross tonnage and above, and for all ships of 100 gross tonnage and above which are engaged in international voyages. The Committee has also agreed to recommend that the carriage of EPIRBs on ships should be mandatory for all ships of 100 gross tonnage and above, and for all passenger ships of 100 gross tonnage and above, and for all ships of 100 gross tonnage and above which are engaged in international voyages. The Committee has also agreed to recommend that the carriage of EPIRBs on ships should be mandatory for all ships of 100 gross tonnage and above, and for all passenger ships of 100 gross tonnage and above, and for all ships of 100 gross tonnage and above which are engaged in international voyages.

**Emergency Position Indicating Radio Beacon (EPIRB)** is a device to alert search and rescue services (SAR) in case of an emergency out at sea. It is tracking equipment that transmits a signal on a specified band to locate a lifeboat, life raft, ship or people in distress.

AN EPIRB is a SECONDARY means of DISTRESS alerting which is to say that it comes later in the hierarchy of alerting SAR authorities in case of distress.

It is mandatory to carry one EPIRB on every ship and two EPIRBs for all Registered ships (and other types of vessels).

## Table of Contents

- [Types Of EPIRB](#)
- [How Does An EPIRB Work?](#)
- [Using an EPIRB](#)
- [False Alerting](#)
- [Testing EPIRB](#)
- [Maintenance of EPIRB](#)
- [PLBs \(Personal Locator Beacons\)](#)

## Types Of EPIRB

1. **COSPAS-SARSAT**– EPIRBs under the COSPAS-SARSAT system work on the 406.025 MHz and 121.5 MHz band and are applicable for all sea areas
2. **INMARSAT E**– 1.6 GHz band is the one which this EPIRB works on. These are applicable for sea areas A1, A2 and A3
3. **VHF CH 70**– This works on the 156.525 MHz band and is applicable for sea area A1 only

## How Does An EPIRB Work?

The device contains two radio transmitters, a 5-watt one, and a 0.25-watt one, each operating at 406 MHz, the standard international frequency typically signaling distress, 406MHz.

The 5-watt radio transmitter is synchronized with a GOES weather satellite going around the earth in a geosynchronous orbit.



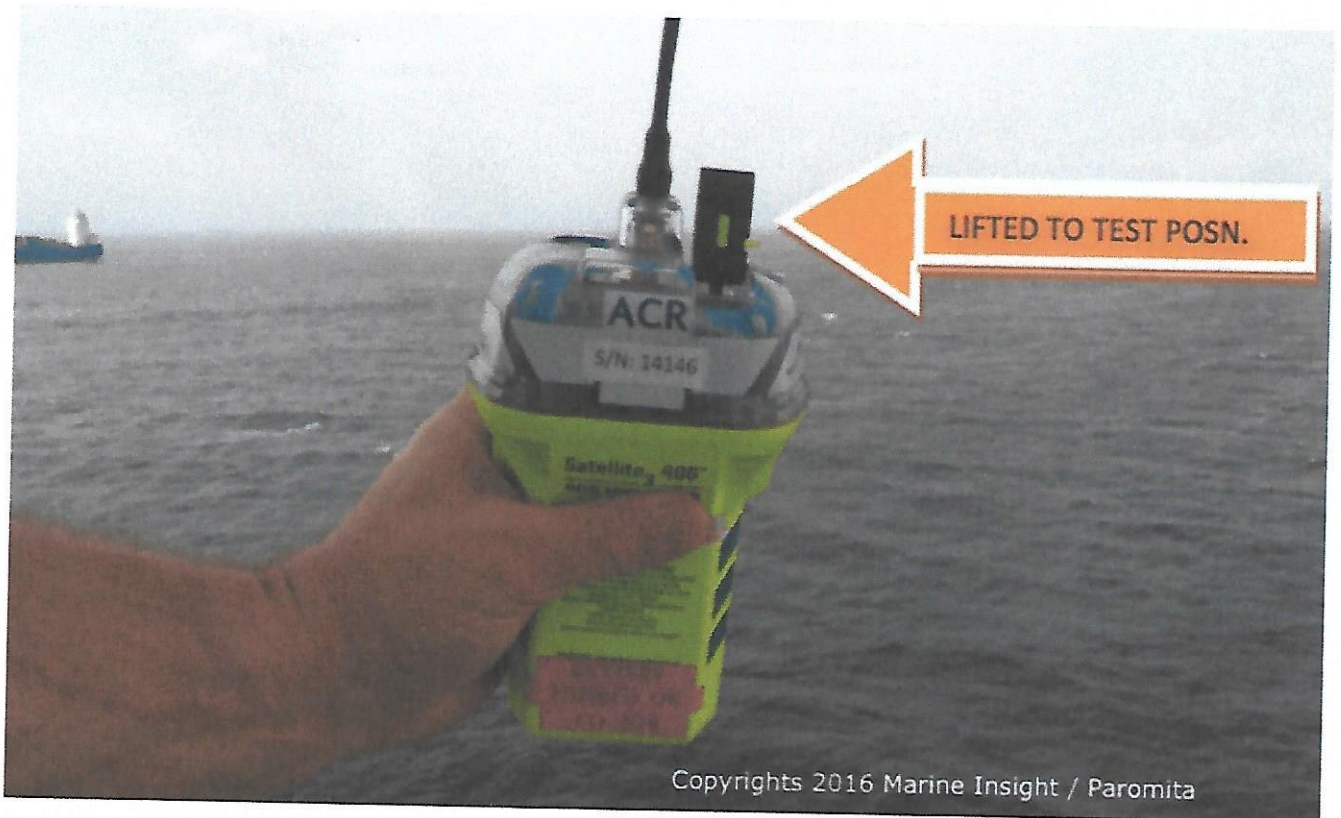
Credits: DPTI South Australia/YouTube

An EPIRB transmits signals to the satellite. The signal consists of an encrypted identification number (all in digital code) which holds information such as the ship's identification, date of the event, the nature of distress and chiefly, the position.

A UIN is a Unique Identifier Number that is programmed into each beacon at the factory. The UIN number consists of 15 digit series of letters and numbers that make up the unique identity of the beacon. The UIN is on a white label on the exterior of the beacon. The UIN is also referred to as the Hex ID.

The Local User Terminal (satellite receiving units or ground stations) calculates the position of the casualty using Doppler Shift (is the change in [frequency](#) or [wavelength](#) of a [wave](#) (or other periodic events) for an [observer](#) moving relative to its source).

The LUT passes on the message to the MRCC (Mission Rescue Co-Ordination Centre). Furthermore, the MRCC is responsible for the SAR ops and oversees the execution of the rescue mission.



Copyrights 2016 Marine Insight / Paromita

In case the EPIRB is not compatible with a GPS receiver, the geosynchronous satellite orbiting the earth can pick only the radio signals emitted by the radio. The location of the transmitter or the identity of the owner cannot be deduced in this case.

These satellites can only pick up trace elements of such signals and they can only give a rough idea of the location of the EPIRB. A signal of 406MHz is treated as an emergency signal as per international standards.

The signal could help you in locating the transmitter even if it is 3 miles away. The vessel or the individual in distress could be identified if the EPIRB is registered.

If an emitter transmits signals of 121.5 MHz, the rescuer or concerned party can reach the lost person even if they are at a distance of 15 miles. The accuracy of reaching the target could be magnified if an EPIRB also contains a GPS receiver.

## Using an EPIRB

The EPIRB needs to be activated to emit signals. This could be done by pushing a button on the unit, or it could happen automatically if and when it comes in contact with water.

The latter variety is known as hydrostatic EPIRB; the quality makes hydrostatic EPIRBs the best choice for sailors because they could be automatically activated in case the ship or vessel meets an accident and finds itself in deep waters.

The point to be kept in mind is that EPIRB needs activation to be operative, and this could happen only when it emerges from the bracket it is placed in. This could be done manually or it could happen automatically, as said earlier. The device is essentially battery-operated. This helps because power is the first entity to be affected in case of a calamity.

## Battery

- 12 Volt battery
- 48 hours of transmitting capacity
- Normally replaced every 2 to 5 years

## False Alerting

It is possible that the EPIRB might get activated by mistake by an individual onboard. In order to prevent a chain of SAR operations in motion, it is imperative that the EPIRB false transmission is cancelled. In case the EPIRB is falsely activated, the nearest coast station or RCC (Rescue Co-Ordination Center) must be informed immediately of this event and as mentioned, cancel it.

The cancellation intimation must also be sent to the appropriate authority (for example, DG Shipping for Indian Registered Ships or for ships plying in India waters when the false alert is transmitted). The ship-owner and/or the agent must also be informed.



Credits: wikipedia.org

## Testing EPIRB

The EPIRB should be tested once a month to ensure operational integrity. The procedure to do so is as follows:

1. Press and release the test button on the EPIRB
2. The red lamp on the EPIRB should flash once
3. Within 30 seconds of pressing the button, the strobe, as well as the red light, should flash several times
4. After 60 seconds of operation, the EPIRB will switch off

## Maintenance of EPIRB

1. The EPIRB must be inspected visually for any defects such as cracks
2. It is advisable to clean the EPIRB once in a while with a dry cloth
3. While cleaning, the switches must be specifically checked
4. The lanyard of the EPIRB must be neatly packed into the container of the EPIRB without any loose ends dangling about
5. The expiry date of the battery must be checked to cover the immediate as well as the next voyage at the least
6. Send the EPIRB back to the service agent or the supplier if the EPIRB fails the monthly checks
7. Change the battery onboard if the facilities are available or send it to the servicing agent if there isn't
8. If the [EPIRB](#) has been used in an emergency, it must be returned to an authorised service agent for a battery change.
9. In the event that the [HRU](#) has crossed its expiry date, the HRU ought to be replaced on board and [HRU](#) must be marked with an expiry date 2 years into the future.

## PLBs (Personal Locator Beacons)



Credits: NOAA/ wikipedia.org

PLBs are basically EPIRBs but for individual entities. These are used to indicate distress for an individual not in the proximity of emergency services. PLBs work in the same as EPIRBs and transmit on the COSPAS SARSAT satellite system in the 406.025 MHz frequency. PLBs are much smaller in size as compared to an EPIRB. They work all across the world, at sea as well as on land.

Once activated, PLBs transmit for a minimum of 24 hours; while the battery life on an EPIRB is at least double (a minimum of 48 hours). An EPIRB is registered to a vessel, whereas a PLB is registered to an individual.

The EPIRB is one of THE MOST important emergency pieces of equipment available onboard in the case of distress. Their care, testing and maintenance must be given considerable time in order that they function at their optimum level when the situation arises.