

GUIDANCE ON MULTIPLE BEACON ACTIVATION

The following guidelines and examples provide advice on activating Cospas-Sarsat beacons if multiple Cospas-Sarsat beacons are available in a distress situation.

1. BEFORE YOU SET OFF

Ensure all your beacons are registered and registration details are updated prior to departure. (Registration guidelines can be found at http://www.cospas-sarsat.int/en/beacon-ownership/beacon-registration-faq#how_to_register.)

Talk among the group and inform all participants of what safety equipment is carried and its uses. Make sure everyone in the group knows how to activate and use the safety equipment and optimise its performance, especially any beacons used.

Ensure you are fully aware of what beacons you have and their capabilities and limitations (is the beacon an ELT, a PLB or an EPIRB; does the beacon have GNSS capabilities; what is the battery life of the beacon; how is the beacon activated and how should the beacon be deployed). This information can be found in the owner's manual or operating instructions as provided by the manufacturer.

Discuss different scenarios; make the group aware of what beacons are being carried and the most suitable beacon to activate. The more safety aware the group becomes, the better prepared they will be.

Discuss the details below prior to departure and ensure that everyone understands the proper use of beacons.

2. BACKGROUND

The simple and unambiguous rule for situations with multiple beacons is - IF IN ANY DOUBT IN A DISTRESS SITUATION, DO NOT HESITATE TO ACTIVATE YOUR BEACON.

Every distress situation is different and the best approach to activating multiple beacons depends on many factors such as the type of incident, the number of persons involved, the location, the time that a rescue will take for the incident and the availability of other safety equipment. The advice provided in the following guidelines must be applied as appropriate in a distress situation.

In a distress situation activate your beacon immediately unless you are aware that several other effectively placed beacons have been activated and your beacon is not required.

The Cospas-Sarsat System is able to detect and locate between 20-40 beacons transmitting in a small area. The exact number depends on a number of factors (including the frequencies used by the beacons and randomisation effects in the timing of the bursts transmitted by the beacons). Notwithstanding the primary guidance in a distress situation of "If in doubt, activate", it is important that excessive numbers of beacons are not activated unnecessarily.

Most 406 MHz beacons also transmit a homing signal. The homing signal may be used by the search and rescue authorities to find the beacon. It is possible that multiple beacons transmitting homing signals in a small area may reduce the effectiveness of the homing localisation. Again, it is important that multiple beacons are not activated unnecessarily.

As a distress situation develops, time and conditions permitting, thought should be given to how many beacons should be activated and remain operating. The following guidelines provide some general advice.

3. GUIDELINES ON ACTIVATING MULTIPLE BEACONS

If in grave and imminent danger, without time to coordinate the activation of multiple beacons, activate your beacon.

In a distress situation it is crucial that a beacon be activated. If it is not possible to coordinate which beacons are to be activated, then no assumptions should be made about any other beacons in the party.

The primary guidance for multiple beacon activations is “If in doubt, activate”.

If a group has multiple beacons and is able to coordinate activation of the beacons, then the group should activate two beacons.

Activating the second beacon provides a backup in the extremely unlikely situation of the first beacon not working correctly. This should provide a level of security to members of the group.

Additional beacons should not be activated unnecessarily as it may reduce the effectiveness of the Cospas-Sarsat System and the search and rescue response.

If there is any doubt as to whether a beacon is transmitting, then activate an additional beacon.

Although it is important to not activate beacons unnecessarily, if there are concerns that one of the activated beacons is not working correctly, then another beacon should be activated. The primary guidance for multiple beacon activations is “If in doubt, activate”.

If there is a choice, a GNSS-enabled beacon should be activated in preference to a beacon without GNSS* capability.

*GNSS - Global Navigation Satellite System such as GPS, Galileo or Glonass

Although the Cospas-Sarsat System is able to generate a location for a beacon not equipped with GNSS, a GNSS-enabled beacon may provide an accurate location more quickly, resulting in a search and rescue response commencing sooner.

If more than one beacon is being activated, preference should be given to activating different beacon models. Different beacon models may operate slightly differently thus further maximising the probability of detection.

If more than one beacon is being activated, preference should be given to activating different beacon types.

There are three types of beacons: EPIRBs, ELTs and PLBs. Although all three transmit the same distress signal, all have different characteristics. For example, EPIRBs are designed for a maritime environment and operate well when floating in water.

Activating different beacon types will provide the most variety in beacon characteristics.

In a maritime situation, an EPIRB should be activated if possible.

An EPIRB is designed for the maritime environment and has a minimum battery life of 48 hours.

In a situation with people in the water, each person in the water should activate a beacon as soon as possible.

People in water can be easily separated and an activated beacon will allow each person to be detected.

A person in water may be unable to activate a beacon after a short time in the water (due to a loss of dexterity because of the cold, for example).

A beacon may have a strobe light that assists locating the person at night.

If activating more than one beacon, the beacons should be placed apart.

The beacons should be positioned to enable a clear view of the sky. A clear view towards the Equator is advantageous. Make sure the antenna is fully deployed and upright and that nothing is covering the GNSS antenna (if applicable).

If possible, move to a position with a clear view of the sky, or consider splitting the party and activating a second beacon in an area with a clearer (or different) view of the sky.

Obstructions (such as mountains, buildings, nearby people etc.) may block the signal from reaching a satellite and delay the detection of a beacon.

Having two beacons with different views of the sky may increase the number of satellites in view.

The Cospas-Sarsat geostationary satellites are all above the Equator. Having clear sky view towards the Equator will increase the chance of beacon detection by a geostationary satellite.

Correct deployment of the antenna will ensure the best possible transmission characteristics of the beacon.

Ideally, when activated in a distress situation a beacon should not be turned off until the distress situation has concluded.

If, however, you find yourself in a situation where multiple beacons are active in very close proximity, then discuss within the group and make a conscious decision to switch off some beacons.

If a beacon is turned on by mistake, it should be turned off as soon as possible and, if possible, the local authority or a Cospas-Sarsat Mission Control Centre informed. Appropriate contact information is available at <http://www.cospas-sarsat.int/en/contacts-pro/contacts-details-all> .

If a beacon is turned off in a distress situation, it may confuse search and rescue operations. If you decide to switch off a beacon then ensure that at least one active beacon is still transmitting.

A balance must be made between confusing rescue operations (although Search and Rescue authorities are used to working with confusing scenarios) and where multiple beacon activations in close proximity can disrupt signal reception at the satellite.

A beacon should not normally be turned off to conserve the battery. EPIRBs have a minimum 48 hour battery life; other beacons have a minimum 24 hour battery life. Search and Rescue authorities rely on updates when conducting an operation. Turning off a beacon prematurely may prevent a successful rescue.

If there is a risk that rescue may take a long time then you may consider reducing the number of activated beacons to prolong battery life.

4. EXAMPLES

A hiking party

A ten-person hiking party with three PLBs needs to activate a beacon as the party is in grave and imminent danger. Only one of the PLBs is GNSS enabled.

When the decision to activate a beacon is made, the party should activate the GNSS-enabled PLB and one other PLB.

The beacons should be placed apart, away from obstructions with a clear view of the sky. If unable to find a clear area then if possible, move to a better location. If possible, ensure that there is a clear, unobstructed view toward the Equator. Make sure the antenna is fully deployed and upright and nothing is covering the GNSS antenna (if applicable).

If the group is in a canyon that obstructs the view of the sky and the group is unable to move as one member of the group is injured, then the group should consider some members of the group moving to an area with a clearer or different view of the sky to activate the second beacon and optimise satellite reception. The group should evaluate the disadvantages of splitting up the group (especially in poor weather conditions such as a snow storm) against the advantages of activating a second beacon with a better view of the sky.

A yacht in danger

A yacht with an EPIRB and 10 crew members, all with individual GNSS-enabled PLBs, is in grave and imminent danger.

The EPIRB should be activated as it is a maritime situation. A PLB should also be activated to provide a second beacon.

If the crew decides to abandon the yacht and launch life rafts, then each life raft should have at least one activated beacon aboard. Ensure any beacon in the life raft is not obstructed. Make sure the antenna is fully deployed and upright and that nothing is covering the GNSS antenna (if applicable).

Crew overboard

A yacht with a GNSS-enabled EPIRB and 10 crew members, all with individual GNSS-enabled PLBs, is swamped by a wave and two crew members are washed overboard.

If the crew overboard are in grave and imminent danger, then each should activate their PLB. The EPIRB on the yacht should also be activated. Any crew in the water need to ensure that their individual PLB is out of the water, ideally fixed to their lifejacket with the antenna fully deployed and upright and with nothing covering the GNSS antenna (if applicable).

Cruise ship in danger

A cruise ship with 6,000 people on board is in danger. Some of the passengers on the cruise ship have PLBs.

When the passengers with PLBs initially board a cruise ship, the crew of the cruise ship should be informed that the passengers are carrying PLBs. The crew of the cruise ship may provide guidance on the use of PLBs on the cruise ship.

In case of emergency, passengers with PLBs should follow specific instructions of the Captain and the crew. If you are separated from the Captain or crew, and you are in danger, then follow the general advice; if in doubt activate your beacon.

Remote yachtsman

A solo yachtsman is in distress and is thousands of kilometres from land. A rescue operation may take more than 48 hours as the yachtsman is in a remote location.

The yachtsman has an EPIRB with a 48 hour battery life and a PLB with a 24 hour battery. Both beacons should be activated. Early detection allows the Search and Rescue authorities to immediately begin search and rescue operations and request the nearest vessels for assistance.

As this remote rescue operation may take more than 48 hours, one beacon should be deactivated after three hours to conserve the battery. If possible, a GNSS-enabled beacon should remain activated. The yachtsman should reactivate the deactivated beacon again for a period of three hours every six hours.

Aircraft incident in a remote location

An aircraft incident occurs in a remote location or inaccessible location. The pilot has an ELT and a PLB both with 24 hour battery life. Activate both beacons.

Consideration should be given to the view each beacon has of the sky to maximise the possibility of being detected. Other considerations include the orientation of the aircraft post incident (i.e., an inverted aircraft would likely mean the fixed ELT antenna would not be viable unless re-oriented), the terrain and obstructions in the area.