



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Personal Locator Devices: Improve Your Chance of Rescue

The problem

- During an emergency at sea, a mariner's chance of survival decreases if search and rescue cannot quickly and accurately identify their location.
- While many commercial vessels are required to carry emergency position indicating radio beacons (EPIRBs), this equipment does not provide the precise location of all individuals who may be in the water and drifting away from the vessel's EPIRB position.
- Although personal locator devices, such as personal locator beacons (PLBs) or satellite emergency notification devices (SENDs), are affordable and can accurately pinpoint a person's location to search and rescue, the use of these devices is currently not mandated.¹
- The NTSB's investigations of casualties in which crewmembers had to abandon a vessel without a means to communicate their individual locations to search and rescue assets found that currently available PLBs provide a location accuracy of about 300 feet and nearly instant search and rescue notification when activated. As a result, we issued Safety Recommendation M-17-45 to the US Coast Guard in 2017 to require PLBs for mariners aboard vessels. We have reiterated the recommendation three times since then (in 2021 and 2022), yet the Coast Guard has not acted.

Related accidents

Following are casualties investigated by the NTSB in which personal locator devices could have assisted or did assist rescuers in locating survivors:

- In 2015, the cargo ship *SS El Faro* foundered in the Atlantic Ocean in a hurricane. None of the 33 crewmembers had PLBs, and none survived or were recovered. Three days after the sinking, searchers sighted the remains of one crewmember in an immersion suit. **The NTSB concluded that had that crewmember, or any others who were able to evacuate, been equipped with a PLB, the device would have provided essential information to focus rescue efforts.** (DCA16MM001)
- In 2016, the fishing vessel *Ambition* flooded and sank in the Bering Sea. **A crewmember's use of a SEND prompted an immediate response from the commercial response coordination center when the Coast Guard did not receive the captain's Mayday call, resulting in the safe rescue of all those on board.** (DCA16FM045)
- In 2019, the fishing vessel *Scandies Rose* capsized and sank in the Bering Sea. The vessel's EPIRB did not broadcast a receivable signal, and, after notifying search and rescue personnel of the vessel's location, crewmembers were forced to abandon the vessel into water without a means of communicating with them. Only two of the vessel's seven crewmembers were rescued by the Coast Guard (none had PLBs). Due to an inadvertent miscommunication of the coordinates of the search area, some Coast Guard responders searched an incorrect area, delaying the rescue of the survivors. **The NTSB concluded that PLBs would have aided in search and rescue operations by providing continuously updated and correct coordinates of crewmembers' locations.** (DCA20FM009)

¹ (a) PLBs operate in the dedicated 406.0- to 406.1-MHz distress band monitored by Search and Rescue Satellite-Aided Tracking; distress alerts are routed directly to a US Coast Guard response coordination center based on the beacon location. (b) SEND communications are routed through a commercial satellite to a response coordination center operated by the company that provides service for the SEND. The response coordination center responds to distress signals by tracking the device's location, notifying the proper authorities and emergency responders, and maintaining communication with the individual using the device.

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Related accidents (continued)

- In 2020, the fishing vessel *Emmy Rose* sank in the Atlantic Ocean off Massachusetts. None of the vessel's four crewmembers had PLBs, and none of the crewmembers survived the sinking. **Had the crewmembers carried PLBs and been able to activate them, search and rescue crews would have had continuously updated coordinates of their locations, thus enhancing their chances of rescue and survival.** (DCA21FM007)
- In 2021, a fire broke out on board the fishing vessel *Blue Dragon* while it was underway in the Pacific Ocean off California. A National Marine Fisheries Service observer on board manually activated the vessel's EPIRB and his PLB, activated the "SOS" button on his SEND, and texted "Fire" with his SEND. **The PLB helped validate the position of the vessel's EPIRB, and the SEND helped responders identify the nature of the emergency, resulting in the rescue of all seven individuals on board.** (DCA22FM003)
- In 2021, the liftboat *SEACOR Power* capsized in the Gulf of Mexico off Louisiana during a severe thunderstorm. Three of the persons on board entered the water and drifted for 2.5 hours or more before they were rescued. The longer someone remains in the water, the lower their chances of survival. **Had PLBs been available to the *SEACOR Power*'s crew when the crewmembers abandoned the vessel, search and rescue crews would have had continuously updated and correct coordinates of individual survivors' locations. As a result, it is likely they would have been rescued earlier.** (DCA21MM024)

What can you do?

Vessel owners and operators can enhance the safety of their crews by providing each crewmember with personal locator devices, such as PLBs or SENDs, to supplement EPIRBs. Consider the following when selecting and implementing crew use of the devices:

- **Determine the best type of personal locator device for your crew.** Some devices transmit via satellite, while others transmit on terrestrial frequencies. Not all devices notify the Coast Guard directly.
- **Provide each crewmember a personal locator device and ensure they carry it.** Devices can be worn in a zipped clothing pocket or a bag attached to a belt or attached to personal flotation devices.
- **Register each crewmember's personal locator device with the appropriate organization.** PLBs must be registered through the National Oceanic and Atmospheric Administration, while SENDs and other similar devices should be registered through the manufacturer or operating company.
- **Ensure crewmembers are aware of the capabilities and limitations of their personal locator devices and understand how to operate their devices, as well as how each type transmits location information.**



Figure 1. Exemplar PLB (left) and SEND (center), and PLB attached to lifejacket (right).

(Sources: bluewatersailing.com [left], powerandmotoryacht.com [center], and Varen [right]).

Interested in more information?

■ **Coast Guard Marine Safety Advisory 01-22** describes maritime distress communication devices available to recreational and commercial mariners, and emphasizes the importance of understanding the capabilities and limitations of each device.



■ **Coast Guard Marine Safety Alert 04-09** emphasizes the importance of promptly registering EPIRBs and PLBs with the National Oceanic and Atmospheric Administration.



NTSB Safety Alerts can be accessed from the **Safety Alerts** page at www.ntsbgov.gov. For additional information on the NTSB investigations in this alert, access the public docket using the investigation numbers (NTSB Accident IDs) cited above. Use the **CAROL Query** to search NTSB safety recommendations and investigations.

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