

Practical Sailor

Independent Tests of Boats and Gear for the Serious Sailor

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January 2010 Issue

Man-Overboard Retrieval Techniques

What is the best MOB rescue tactic for your boat and crew?

The term Man Overboard (MOB) has been caught in the tide of political correctness, and terminology like Crew Overboard (COB) and Person in the Water (PIW), the U.S. Coast Guard's latest designator, have changed safety semantics. Regardless of the phraseology, it remains a cry that every sailor hopes to never hear.

Practical Sailor has looked at this important topic on several occasions over the past few years. There was a comprehensive two-part report on gear and tactics in November 2005 and January 2006. In May 2006 and April 2007 we looked at throwable rescue devices. And in May 2008, *Practical Sailor* Technical Editor and marine safety expert Ralph Naranjo compared a variety of electronic man-overboard beacons and alarms.

This update focuses on a key element to a safe recovery: seamanship. Our findings—some of which contradict or amend current thought on the subject—are based on analysis of a series of on-the-water drills on Chesapeake Bay. The drills were carried out earlier this year under the direction U.S. Naval Academy Sailing Master Dan Rugg and with the participation of the Philadelphia Sailing Club. Naranjo was invited to observe.

By taking a close look at how the crews from the Philadelphia Sailing Club members (aboard a J/37, representing mainstream racer/cruisers) and midshipmen from the U.S. Naval Academy (aboard the McCurdy performance-oriented offshore sailors) react to overboard situations, *Practical Sailor* hoped to develop some valuable insight into what works most effectively in any given condition and how to optimize a crew's chances for success.

Anatomy of a Recovery

The wide range of variables that can come into play cannot be overstated. It is clear that factors ranging from crew skill and size to the vessel's behavior under different sea states affect the challenges involved in a rescue and define the right maneuver to use. However, some common denominators stand out.

First and foremost, the success of any man-overboard drill will depend on a clear chain of command. This may sound militaristic, but in a crisis, the most capable person needs to be making the calls. Naturally, the person at the helm at the time of the incident must be able to carry out the initial steps in the maneuver, at least until the skipper or watch captain decides whether to step in. Regardless of who is at the helm, command resides in one person, and it's their job to clearly direct the rescue process.

Providing a victim with flotation is part of the first phase of every overboard response, even if the victim is wearing a life jacket. The additional floating cushions and other throwable rescue gear can also make the victim easier to spot. Marking the location with an MOB pole, light and drogue-equipped horseshoe, or a man overboard module-type device (MOM) is also an imperative part of the early response.

This is one point where *Practical Sailor's* view diverges from some other accepted guidance. U.S. Sailing, the governing body of sailboat racing in the U.S., advises that such poles and spars be reserved for later deployment. In Appendix D of the ISAF Special Regulations that govern offshore racing, U.S. Sailing prescribes: "The pole (strobe and dan buoy) is saved to put on top of the victim in case the initial maneuver is unsuccessful." This blind assumption that the first maneuver will bring the crew closer to the victim is a leap of faith that's unwarranted and dangerous, in our view. In numerous incidents, the initial sighting of the victim being left astern was the last sighting.

Man Overboard Modules

Our two-part series in 2005-2006 delved into the pros and cons of the MOM 9 (man-overboard module), a popular, self-contained, inflatable pole and flotation device that can be deployed to a person in the water. One advantage is the ease with which it can be



Photos by Ralph Naranjo

What no sailor ever wants to see: The stem of his boat sailing away into fading light

released. However, during independent testing in 2005, a unit repacked by an approved vendor opened with its lines snarled around the vertical spar, causing it to kink in half. The ease and speed with which a MOM can be deployed outweighs the snarl issue, and it is a viable option, especially for shorthanded crews. Deploying a MOM or similar pole/strobe/flotation combo should be a part of any overboard routine. Since it is expensive to rearm and repack the MOM 9, mock deployment can be simulated with a faux pull-handle taped to the top of the MOM.

The Right Stuff

Each crew member should be able to execute a recovery maneuver. Naturally, it makes most sense to have the best helmsperson on tiller, the person with Chuck Yeager's 20/10 vision acting as spotter, and the agile ex-lifeguard ready to help the victim, in or out of the water. But the situation seldom sets up so conveniently, so role-playing must remain fluid. For example, the person closest to the overboard gear should launch it, the person nearest the GPS hits the MOB button and shouts that the position has been recorded. Scribbling a lat/lon position in the log or on the margin of a chart is also good practice.

Perhaps the most important task of all in a man-overboard recovery is the job of continually spotting the person in the water. If there are enough hands on board, the designated "spotter" should concentrate only on this task. In this high-tech age, spotting can be assisted by night-vision equipment or image-stabilized binoculars. An infrared-reading thermal imaging system can also help in locating a warm spot on a cooler sea surface, although these are extremely expensive. (FLIR, the company whose fixed thermal imaging camera we reviewed in June 2008 recently unveiled a portable unit for \$3,000.) These aids can be used alone or in conjunction with one of the signal-beaming pendants like the Mobi-Lert (www.mobilarm.com) that *Practical Sailor* reviewed in May 2008. New 406MHz personal locator beacons (PLBs) are also a promising technology. Ultimately, the best fix of a person in the water remains a visual one, and the crew that stays closer to the victim has a much better chance of completing a successful recovery.

Recovery Maneuvers

At this point, all on board are up to speed on what's happened and the helmsperson has begun the recovery maneuver. The crew has been assigned key roles, and each member knows what must be done. The ultimate goal of all under-sail recoveries is a well-aligned close reach that brings the boat back to the victim just as the boat speed drops to zero. Racers have an advantage: the more trained hands working together, the better the chances of success. Cruisers face a serious handicap: too many tasks and too few hands. Success of the shorthanded crew will rely greatly on the speed and coordination of the response, as well as close familiarity with the various rescue maneuvers. Another key component is the type of recovery gear onboard. Illustrations and capsule summaries of the most common rescue maneuvers appear on the facing page, but the following observations that emerged from the Chesapeake Bay exercises should also be taken into consideration.

Lifesling

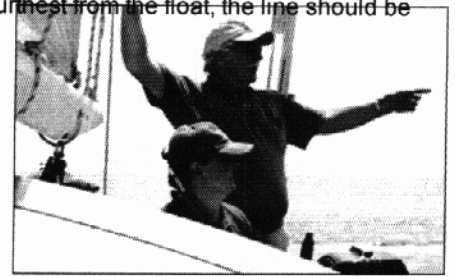
For the shorthanded sailer, the challenge lies in steering the vessel while keeping the victim in sight, and at the same time coping with the sails, recording the MOB's position, and other steps in the routine. In such cases, the Lifesling can be a valuable aid, helping to streamline the recovery process. Profiled in our 2005-2006 report, this horseshoe-shaped flotation device can be deployed early in the maneuver. Unlike the life ring, spar, or dan buoy deployed immediately, it stays connected to the boat by a safety line.

The Lifesling-assisted rescue allows for less-precise boathandling. It can be used in tack-only type maneuvers (Figure 8, Fast Return, Deep Beam Reach) or in those that incorporate a jibe (Quick Stop), with one important proviso: Although the Lifesling2 instructions say "circle the victim until contact is made," this is misleading. As any waterskier knows, a circular pattern is not an effective way to get the line into the hands of the skier. To bring the rescue line attached to the Lifesling into the hands of the victim, a button-hook approach is much preferred. During testing, the optimum Lifesling delivery always included passing closely by the victim prior to a sharp turn on the final approach. A wide turn that leaves the victim in the center of circle—as many published illustrations suggest—sharply reduces the chance of success.



Once the victim is securely connected to the Lifesling, crew can haul him to the boat, hand over hand or using winches.

The Lifesling's floating poly line should not be coiled into its bag. Beginning at the point furthest from the float, the line should be shoved to the bottom of the container. If a snarl occurs during deployment, it usually can be coaxed out with a couple of tugs. If a tack-to-recover type maneuver is used, the Lifesling is not deployed until the tack has been completed and the return to the victim begun.



None of the tested maneuvers are ideal for all circumstances. On a fully-crewed raceboat, the Quick Stop can be very effective, but for shorthanded cruisers, motoring back to the victim might well be the best choice. Some maneuvers will work better for certain boats, or certain circumstances. Ideally, the spotter should have but one chore. Keep an eye on the victim.

If the Lifesling is deployed using a modified Quick Stop (Figure 1, page 8), there's a jibe involved and reducing speed becomes imperative. Center the mainsail early, and as the boat bears off, furl or drop the jib. Reducing sail area is key, because once the victim slips on the horseshoe float, dragging them through the water can be fatal. If the jib has already been furled or dropped, turning the boat to windward and dropping the mainsail halyard will stop the boat in its tracks. Once the boat is stopped, the victim can be hauled or winched in, and a ladder, swim step, parbuckle, or halyard can be used to bring them back aboard.

Quick Stop

The fully-crewed race boat faces a very different challenge. There's an ample number of able crew available, but the boat will likely need to be quickly slowed down prior to any rescue maneuver. This is especially true of a modern lightweight racer that simply can't shift from a planing reach to a Quick Stop turn in a boat length. Consequently, the first part of their recovery maneuver is a counter-intuitive sprint away from the victim. Because of this inevitable and distressing separation, the appeal of locator beacons and direction-finding equipment has gained ground among racers, as has harness and jackline use.

Power Assist

No extra points are given for rescuing a victim under sail. It's true that a spinning propeller is dangerous, but far more lethal is the boat that never gets back to the person in the water. Starting the engine, keeping it in neutral, and after checking for lines in the water, using it as needed to help control the final approach is prudent seamanship. In some shorthanded scenarios, a Lifesling rescue under power may prove to be the best option available. Naturally, the engine needs to be in neutral as the final approach to the victim is made, and as soon as contact is made, the engine should be shut off.

The Final Approach

All too often, in the rush to quickly return to the victim, the boat sails right by the person in the water at 3 knots or more, making rescue both dangerous and unlikely. The helmsperson and sailhandlers work in conjunction to slow down during the final close reach approach to the victim, arriving with about a half-knot of boat speed. On the ocean, the pitching moment can kill forward motion too soon. Conversely, in flat water, the helmsperson must start slowing down much sooner. This is why practice should take place in all conditions in which the vessel will sail. Ideally, a sailboat completes a rescue maneuver by nudging alongside the person in the water, a line secures the contact, and he or she scurries aboard on a swim step or ladder. More often, however, a rescue quoit, life ring, or boat hook is needed to make contact. A thrown Lifesling or life ring can cover short distances, but if neither is available or the distance is greater, a rescue quoit like the Marsars 2-in-1 (reviewed in May 2006), can be put into action. Weighted at the end with a floating ball, a rescue quoit is preferred over a one-shot throw rope for this purpose because it can be more easily re-deployed. Regardless of what device you use to make contact, all crewmembers should practice its use.

Civilian Sailors and Midshipmen

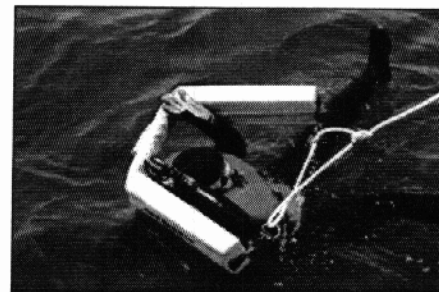
Training makes a big difference, and after observing both the USNA midshipmen and members of the Philadelphia Sailing Club execute crew-recovery maneuvers, some important observations can be made.

Both groups quickly learned to cover the requisite aspects (shout, throw, steer, fix) of the recovery drill. The biggest common problem was simultaneously keeping track of vessel movement, true wind direction, and the person in the water. Many misjudged the true wind, and attempted to return to the victim on a deep reach, making slowing down impossible. It was interesting to note how quickly some of the sailing club members adjusted to the J/37's responsive helm. Its ability to turn on a dime surprised sailors accustomed to more traditional sailboats. The bottom line: It takes a familiarity with close-quarters boathandling to place the boat where it belongs in MOB maneuvers.

Another important variable noted was leadership. The best helmsmen displayed both an ability to effectively steer and lead, informing the crew what would happen next, and who should have a lead role in each aspect of the recovery.

One of the key issues stressed by USNA's Rugg was that the practice conditions were optimum, in broad daylight, flat seas, and fair weather. He also noted that because the participants knew the exercise was a drill, they didn't experience the usual shock and stress. He emphasized that only through periodic training with a regular crew can you be fully prepared for an actual event.

The Philadelphia Sailing Club members found that the Quick Stop maneuver—while suited to youthful midshipmen at the Naval Academy and appropriate for many "round-the-buoys" sailors—is not always the best bet for everyone. On one hand, it keeps the crew closer to the person in the water. But it requires an abrupt stop, a jibe, and can be complicated by double-digit speeds, spinnakers and running rigging like backstays and preventers. Shorthanded mom-and-pop crews are certainly better off with a Lifesling. Regardless of the recovery process chosen, it's vital that all crew members are on the same page and have spent time training together with a specific maneuver.



Getting into the Lifesling while wearing a PFD is not so easy. It is even harder with the inflatable Lifesling.

Conclusions

We went into this project hoping to find a recovery procedure that could be given a "one size fits all" nod of approval. U.S. Sailing favors the Quick Stop. For their constituency, sailors aboard fully-crewed, highly maneuverable race boats, it makes a lot of sense. But even the pro racer sees problems when their boat speed approaches that of a planing Boston Whaler. Under such conditions the prospect of an abrupt turn into the wind spells big trouble.

The mom-and-pop crew cringe at the thought of the quick tack and impending jibe just when their crew number has been reduced by half. Add to this the challenge of coming alongside and nimbly getting hold of your partner before the bow falls off, and the prospect of being lost at sea turns into the potential of being drowned by the boat. In short, the Quick Stop has its merits, but it does not rise to the "one size fits all" rescue technique. That's why U.S. Sailing's Training Committee includes Reach-Tack-Return (Figure 8) maneuvers and under-power Lifesling approaches in their textbooks.

The Figure 8 and its tack-to-return cousins eliminate the jibe and are easier to accomplish, especially in heavier winds, but there are several inherent pitfalls. The most significant is the initial necessity to sail away from the victim. It's tough enough to minimize this dangerous separation in optimal conditions. However, in 20-knot winds at 0300, keeping the separation distance to just a few boat lengths is impossible. A two-minute spinnaker takedown can leave a victim a quarter-mile away.

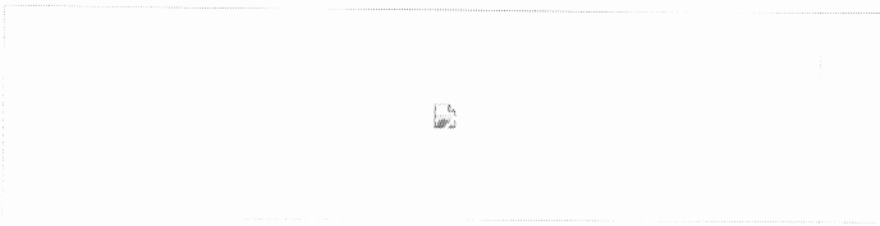
Each iteration refers to sailing off just a couple of boat lengths, but in real life, a windy, dark, storm-tossed night at sea can tally up more boat lengths of separation than desired. Losing sight of the person in the water is a big deal and the helmsperson must be ready to execute the tack in a timely fashion.

A key moment during the "tack-only" maneuvers occurs when the vessel is head-to-wind, midway through the tack, and the victim's location is noted. At this point, the helmsperson can carefully note the true wind. The most common problem in all types of recoveries is found in the final approach when a helmsperson has not maneuvered far enough downwind and must approach on a beam reach that eliminates the ability to de-power the boat.

The Fast Return and the Deep Beam Reach, with all sails up, may be fine in lighter winds and flat water, but not in heavier conditions. This is why Volvo Ocean racers and many other high-velocity ocean racing programs are looking closely at electronic beacon technology.

Vessel design plays a big role. The long keel, high directional stability of a classic cruiser means it won't spin on a dime, nor will it bleed off boat speed quickly. The deep high-aspect ratio foils of a modern race boat deliver the nimbleness needed for the final approach, and can accelerate and decelerate quickly. However, the easy-to-steer race boat may have luff-tape sails that are hard to douse and harder to keep from going over the side. The bottom line is that each boat differs and how a rescue maneuver is implemented must take underbody design and deck layout into consideration.

Ultimately, sailors need to test each of the alternatives, not just on a light-air Sunday afternoon, but at sea in varying conditions and at night. A fender lashed to a milk crate with a strobe tethered to the makeshift Oscar can play the role of a person in the water. After these sea trials, settle on the technique that best fits the handling characteristics of your boat and the skills of your crew. Let each person take a turn at different responsibilities, except of course, the "victim" who is sent below to think about what it would be like in the water. Finally, recognize that preventing an overboard incident is the only alternative that comes with a back-on-board guarantee.



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